

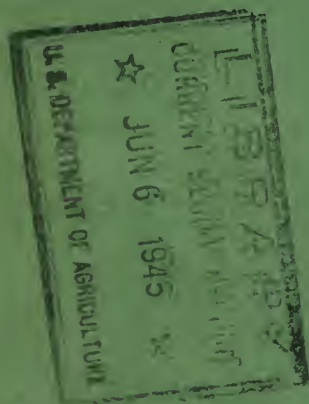
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INDUSTRIAL FEEDING MANAGEMENT



U. S. DEPARTMENT OF AGRICULTURE
WAR FOOD ADMINISTRATION
Washington, D. C.

Prepared by the Committee on the Nutrition of Industrial Workers of the National Research Council in collaboration with the War Food Administration. Appreciation is extended to all those who contributed so liberally of their time and knowledge—particularly to Marie L. Casteen, who prepared the original manuscript for the Committee, and to Ruth M. Lusby, Erwin G. Adelberger, and Ivon H. Blackman of the War Food Administration.

This publication supersedes the pamphlet entitled Manual of Industrial Nutrition [NFC-1].

FOREWORD

Although the war production program of World War II gave impetus to in-plant feeding, the practice of providing eating facilities for their employees was established in many industrial plants long before the onset of the war. Generally, however, little attention was given to the relationship between nutrition, good health, and industrial efficiency.

During recent years, the demonstration of the value of improved nutrition in maintaining the health and working efficiency of workers has broadened considerably the concept of in-plant feeding. Industrial feeding now involves not only providing sufficient facilities for reaching all the workers who should have access to them, but also the use of these facilities as a means for disseminating appreciation of the principles of good nutrition.

It is in the plant cafeteria or lunchroom that nutritional practices can be most effectively correlated with the theories of good nutrition. The simplest presentation of this idea is by far the most forceful. For example, a well-chosen, nutritious "special" lunch, priced so as to be within the reach of all, is far better "merchandising" of nutrition to most workers than formal lectures on the subject.

In-plant feeding at its best emphasizes the service of meals of high nutritive quality in a form and at a price attractive to the majority of workers. The purpose of this publication is to assist industry and food-service managers in achieving this objective.

Basic menu patterns are given for several different types of feeding services (for example, cafeteria and mobile units). Although the menus were selected because they are nutritionally adequate, a detailed account of the theory of nutrition has been omitted, since many excellent textbooks are available for reference. A brief description of the types of facilities needed to meet practical operating conditions is included and the principles upon which the choice of facilities and equipment should be based are discussed. The management of food service employees is discussed and correlated with the types and design of the facilities described. Job descriptions are provided. Methods of conducting nutrition-education activities within the plant are described and, finally, a list of pamphlets and other promotional material is given.

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CONTENTS

	PAGE
General considerations in the operation of in-plant food services	1
Management of food preparation and service	3
Planning the basic menu	4
Standards for meal service	11
Management summary	17
Facilities and equipment for industrial feeding	18
Types of service units	21
Design detail	23
Food-service personnel	27
Job descriptions for necessary occupations in industrial feeding	29
Filling key positions	32
Educational programs	34
In-plant educational programs	35
Educational programs for workers' families	37
Training programs for management of food-service units	37
Nutrition programs planned by business organizations	38
Sources of industrial feeding and nutrition educational materials	41
Government publications, posters, and films	41
Other sources	43
Literature cited	45
Addresses of regional offices of the War Food Administration	46

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GENERAL CONSIDERATIONS IN THE OPERATION OF IN-PLANT FOOD SERVICES

Before planning in-plant feeding facilities, several factors of a general nature should be considered so that the resultant feeding operation will provide the best possible service to the maximum number of workers. Because the ultimate success of an in-plant food service depends upon its acceptance by the employees, it is a wise procedure for plant management to include a committee representing the employees in discussions relating to the planning of the feeding facilities.

Nearby Commercial Restaurants

Where restaurants exist near the plant, they may well serve the purpose of an in-plant feeding facility. When the majority of a local restaurant's patronage is derived from the plant personnel, plant management should insist that the restaurant maintain reasonable standards. Frequent checks should be made to see that it does not relax its standards. There should be adequate floor space and counter facilities to serve the workers promptly. The food must be wholesome and proper attention should be given to the nutritional value of the food served. The hours of service should be planned to accommodate workers on all shifts. It may be possible to make some arrangement so that supplemental snacks are prepared in the restaurant, and distributed in the plant.

Food Problems of Plants Operating on a Three-Shift Basis

In plants where there are three shifts, the first, or day shift, usually begins between 6:30 to 8:00 a.m. and ends between 3:00 and 4:30 p.m. The second, evening or swing shift, begins when the day shift ends and it lasts until midnight or 1:00 a. m. The third, night or "graveyard" shift, extends from the end of the evening shift to the beginning of the day shift. In most plants the evening and night shifts are referred to as odd shifts. It has been found that most workers prefer to work on the day shift because their normal sleeping hours and food habits are not upset, as they are on the odd shifts.

These points should be considered when a plant is run on three shifts:

1. If adequate provision is made for serving food to the day shift, then the same equipment and facilities will take care of the workers on the other two shifts.
2. A three-shift food-service organization is necessary when food is supplied to the workers on all shifts. Usually the day staff of food-department employees is larger because more workers are fed and because the managerial staff and department heads are then on duty.
3. In some plants practically all the food is prepared by the day shift, leaving very little preparation for the employees on the other two shifts. This practice is unsound, not only because the taste of the food served to the odd

shift is poor, leading to much dissatisfaction among the workers, but also because the nutritive value of many foods deteriorates rapidly on standing.

4. The eating habits of workers should be studied so that meals can be served to correspond with food habits and nutritional needs. According to a study made by Engel-Frish (2)¹ on the effects of odd shifts upon the food habits of workers, "workers as a rule try to adjust their food habits to the normal day with as little substitution and change as possible."

5. Meal schedules should be adapted to conform with the needs of the majority of the workers. Provision for breakfast should include accommodations for the night-shifters as they go off duty and for the day-shifters as they come to work. Early breakfasts can be prepared by one cook and served by several counter employees who are scheduled to begin work somewhat earlier than the regular day crew.

6. Between-meal snacks should be made available to workers during their rest periods, the latter being scheduled from 2 to 2½ hours after the beginning of each half of the shift.

Length of the Lunch Period

The length of the lunch period has as much to do with the happiness and satisfaction of industrial employees as any other one working condition. When a worker has insufficient time to eat his food, when he feels that he must eat hurriedly and immediately rush back to work, his general health and morale may suffer.

Studies of the length of lunch periods indicate that:

1. Thirty minutes is generally the most satisfactory lunch period (9). It is the duty of plant management to see that the eating facilities are near enough to working units and so operated that the worker will have at least 15 minutes in which to eat his food. This will allow him to eat under normal conditions, that is, to relax while eating and to visit with fellow workers.

2. In large plants the lunch periods should be staggered among workers in different sections of the plant to prevent the formation of long lines at serving counters. For instance, if the day shift starts at 6:30 a.m., the first lunch period might be from 10:30 to 11:00 a.m., the second, from 10:50 to 11:20 a.m., and the third, from 11:10 to 11:40 a.m.

3. Cafeterias should be organized to provide rapid service, and foods and supplies should be served promptly when the workers arrive. A good supply system is essential so that service is not held up for replacements of food, dishes, or other supplies.

4. When decentralized service is used, and the food is served from canteens or mobile units, there should be a sufficient number of these units located at strategic places to permit the workers to be served promptly and to eat without being unduly hurried.

Women Workers in Industrial Plants

Many plants accustomed to men workers now have to adapt their organizations to women workers as well. An interesting study of this subject was made by Margaret T. Mettert (6). According to her findings:

1. Women workers adapt themselves readily to their jobs but their fullest production depends upon safeguarding their health.

2. Of greatest importance in building up resistance to disease of occupational as well as general origin is proper nutrition and the prevention of chronic fatigue. Early studies of lead poisoning give some evidence that the excessive sickness of women workers was due to their relatively poorer state of nutrition. The women were paid lower wages than men, and their food budgets were on a lower scale.

3. Women workers are ill more frequently than men. The Boston Edison Company, in analyzing all disabilities for one day or longer occurring in a five-year period from 1933 through 1937, found male employees averaged 6.4 days a year lost because of illness, but female employees averaged 9.9 days.

¹ Figures in italics refer to Literature Cited, p. 45.

It appears that plants employing women should make special provisions for satisfactory and nutritionally adequate meals, comfortable rest rooms, scheduled rest or relief periods at stated intervals during the shift, between-meal feedings, and lunch periods of at least 30 minutes. In other words, the employment of women workers does not change the picture materially except that the services discussed assume increased importance. Women sometimes spend less for their meals than men do, but they often are more fastidious about their food. When women workers are served, the menu may have to be adapted to meet their food preferences.

Operating Industrial Feeding Units

Many plants lease their food services to industrial feeding contractors. Some of these plants install the food service units and hire a contractor to operate them; in others, the space is leased or given to the contractor who installs the preparation and service units necessary to provide the food service specified by plant management. The contractor system presents certain advantages to the plant, for example:

1. Plant management is relieved of responsibility for operating the food service.
2. An industrial feeding contractor with food-service units in several plants may be able to operate more economically than is possible under plant management.

The advantages of plant-managed food service units stem from the fact that the incentive for operating them is the desire to help maintain good personnel relationships by providing good food and eating conditions. Such operations as a rule do not expect to make a profit. If there is any surplus it may be invested in cafeteria improvements or be used for increasing the quality of the food, or lowering the price of the meals. Several arrangements may be made by plants for operating food service units:

1. They may be operated under employee management. Here, again, the organization varies in different plants. Some have an employee operating committee consisting of representatives from each plant division under the direction of a capable executive. In some instances the employee committee is advisory, while in others, it assumes full responsibility. Either the committee or management must employ a well-qualified dietitian or manager to have charge of the operation and to purchase the food, plan the menus, and employ the staff.

2. Plant management may assume sole responsibility by operating through a manager of its own selection.

Generally the manager is paid a fixed salary, but often the remuneration is a percentage of the profits. In both instances the food-service manager should be directly responsible to plant management for the quality of the food service.

MANAGEMENT OF FOOD PREPARATION AND SERVICE

The preparation of food is a manufacturing process, and the basic-menu pattern is just as much a planning problem, though less complicated, as building a ship, plane, or tank. After the basic-menu pattern is established, the engineering department plans the kitchen lay-out, and management selects and purchases essential equipment. The food-service manager makes plans for food purchasing, for the organization of the staff, and for the operation of the unit. Each step in the preparation and service

of food should be as carefully studied from the standpoint of speed, efficiency, and economy as these factors are studied by engineers of industrial production.

There are a number of steps through which food must go before it is finally assembled into meals for workers. It must be purchased, received, stored until it is requisitioned by the food departments, cleaned, and roughly processed for cooking, prepared, and finally served.

Planning the Basic Menu

The purpose of industrial feeding is to provide workers with nutritious and appetizing meals at prices they can afford to pay, and in a form that appeals to them. To realize these ends requires that careful attention be given (a) to planning meals that supply the essential nutrients; (b) to purchasing foods in order to secure the best quality and greatest return for the money expended; and (c) to preparing and serving foods in order to conserve their food values and to make them palatable and attractive.

Supplying the Worker's Food Requirements

In planning meals the total daily needs of the workers should be considered. Each meal served in the plant should provide one-third or more of the day's requirement of the dietary essentials.

The quantity of food workers require varies generally with their size and the kind and amount of work they do. A worker in a heavy industry may need 4,500 calories or more; one doing lighter work may need 3,000 calories; and an office worker may need 2,500 calories. Fortunately, most people engaged in physical work tend to eat enough food, if it is available in a form that appeals to their taste, and if it is served at a price they can afford.

The first consideration in planning meals is to meet the energy requirement by (a) having a good variety of inexpensive energy foods on the menu and (b) serving generous-sized portions of foods. The second consideration in planning meals is to be sure that each menu contains sufficient "protective" foods. These foods contain tissue-building and body-regulating materials essential to good health. When planning a basic menu for industrial workers the dietary allowances for adults as recommended by the Food and Nutrition Board of the National Research Council (7) should be followed. According to the Food and Nutrition Board, "The safest way to insure that the dietary allowances are met is to include certain foods in the daily diet in specified amounts. One dietary pattern which contains a variety of foods commonly available is given below:

Milk	1 pint.
Egg	1 daily, if possible. (On day not used, beans, peanuts, cheese, or more milk or meat to be used instead.)
Meat, fish, or fowl	1 or more servings.
Potato	1 or more.
Vegetables	2 or more servings. One green or yellow.
Fruits	2 or more. One citrus fruit or tomato or other good source of vitamin C.
Cereals and bread	Whole-grain, enriched, or restored.
Other foods as needed to complete the meals."	

Although there are other food combinations that can be used to make an adequate diet, the list here given is one that fits the dietary pattern of the average American and can be followed in planning the day's meals. Adaptations of this food pattern may be necessary because of regional or traditional food customs or available food supplies. In such cases, allowances should be translated into appropriate quantities of foodstuffs available and suited to the taste and income level of the group concerned. Alternate foods may be chosen according to the "Basic 7" food guide, prepared by the War Food Administration, U. S. Department of Agriculture.²

Basic-Menu Pattern

The basic-menu pattern should be flexible enough to permit each day's menu to be fitted into it. It should be a guide for the provision and distribution of nutritious foods.

Menus for each meal should be planned at least 1 week in advance. By planning in advance, it is possible to check individual menus for variety, proper distribution of foods, and palatability. When it is necessary to make substitutions, this can be done without modifying the basic-menu plan so far as nutritive value is concerned. A set of menus planned in advance is as important to the successful operation of an industrial food service as is a plan of work to a well-organized business.

Any one of the meals eaten on the job is likely to be the main meal of the day for some workers. Thus every meal served in a plant should provide more generously of the protective foods than might be necessary if all the workers' meals were eaten in the plant. Certain foods should be available at every meal. These are: Milk; citrus fruits or fruit juices and tomato juice; one or more good-quality protein foods; and whole-grain and enriched bread or cereals. Green and yellow vegetables and potatoes should be served at two of the daily meals, and potatoes could well be available at all three.

Special points to consider in planning the different meals, together with suggested menu patterns, are given below:

BREAKFAST PATTERNS

A Good Breakfast

A good breakfast for workers doing heavy work would include:

1. Fruit rich in vitamin C.
2. A serving of protein-rich food.
3. Generous amounts of one or more good energy foods, including enriched or whole-grain bread and butter or fortified margarine.
4. Milk.
5. If desired: Coffee or tea; jams, jellies, preserves, stewed or canned fruit.

If a plate breakfast is served, it should include these foods, in amounts to provide 1,000 to 1,200 calories or more. In the cafeteria, a good assortment of foods from each group should be offered, and these should be arranged on the counter so as to encourage the selection of a well-balanced breakfast.

² The "Basic 7" foods are listed on page 18. For further information consult pamphlet NFC-4, National Wartime Food Guide.

Foods That May Be Served for Breakfast

1. *Fruits rich in vitamin C*²
 An orange, whole or sliced (medium sized).
 ½ grapefruit (large).
 ½ cantaloup (large).
 Orange or grapefruit juice, 6 ounces.
 Tomato juice, 10 ounces.
2. *Protein-rich foods*
 Eggs, boiled, poached, fried, scrambled, or omelets.
 Ham, sausage, scrapple, Canadian bacon.
 Meat hash, chicken, beef or corned beef.
 Codfish, finnan haddie, salt mackerel, or fresh fish.
3. *"Energy" foods*
Grain products and potatoes
 Ready-to-eat or cooked cereal; whole-grain, enriched or fortified.
 Potatoes: Baked, creamed, hashed brown, plain boiled, French fried,
 or American fried.
 Fried corn meal mush with sirup.
 Hominy grits, plain or fried.
Breads
 Whole-wheat or enriched-flour rolls, muffins, hot biscuits, sweet rolls.
 Pancakes, with butter, sirup.
 French toast with jelly or sirup.
 Toast, whole-wheat or enriched bread.
Fats
 Butter and fortified margarine.
 Bacon.
4. *Milk, and cocoa made with milk.*
5. *Coffee and tea.*
6. *Other foods*
 Preserves and jellies.
 Orange marmalade.
 Stewed prunes, apricots.
 Applesauce or baked apples.
 Canned fruits.
 Fresh fruits in season.

It is not essential that a large variety of foods from any group be served every day. Some staple dishes like citrus fruits, bacon and eggs, toasted bread, milk, and coffee, always should be available; others may be changed from day to day to afford variety.

Sample Cafeteria Breakfast Menu

<i>Fruits</i>	Grapefruit juice, tomato juice, sliced oranges.
<i>Cereals</i>	Cooked cereal with whole milk or cream (as rolled oats, wheat flakes, farina, etc.).
<i>Main dishes</i>	Scrambled eggs, pork sausage (or bacon, ham, scrapple, etc.).
<i>Breads</i>	Whole-wheat and enriched bread and/or rolls with butter or fortified margarine.
<i>Milk</i>	Milk, and cocoa (made with milk).
<i>Beverages</i>	Coffee and tea.

Sample "Plate" Breakfast

Grapefruit juice.
 Wheat flakes with whole milk.
 Scrambled eggs.
 Whole-wheat or enriched bread with butter or fortified margarine.
 Milk or cocoa; coffee or tea.

It should be noted that milk has been listed as a food, rather than as a beverage. It may, of course, serve both purposes. The consumption of milk may be increased by including it in the meal

²The amount given will meet the daily recommended allowance, or close to it.

along with coffee or tea, rather than offering a choice between milk and other beverages.

LUNCH AND DINNER PATTERNS

The basic-menu pattern for lunch and dinner can be similar since the worker may regard either as lunch, dinner, or supper, depending on his work shift. In general, a menu pattern for these meals would be:

1. Appetizer (soup, fruit juice, tomato juice, fruit cocktail, etc.).
2. Protein-rich main dish of meat, poultry, fish, or alternate food.
3. Potatoes.
4. Leafy green or yellow vegetable.
5. Salad.
6. Whole-wheat or enriched bread and/or rolls with butter or fortified margarine.
7. Dessert (including fruit).
8. Milk and cocoa.
9. Coffee and/or tea.

It is not essential, in a "plate" meal, that an appetizer always be served, or that both a cooked leafy green or yellow vegetable and a salad be included. A well-planned menu might substitute a salad for the appetizer, or a green salad for the cooked vegetable.

When planning a selective cafeteria menu it is well to include one or more foods from each group listed, in order to please varied tastes. Sandwiches may be regularly included, as well as breads, where there is a demand for them.

Basic Cafeteria Menu for Industrial Plant (Moderate and Very Active Work)

- 1 Soup and/or fruit juice, tomato juice, fresh fruit cocktail
 - 2 or 3 Entrees
 - 1 or 2 Meats (including fish and poultry)
 - 1 Meat alternate
 - 3 Vegetables
 - 1 Potato (white or sweet)
 - 2 Leafy green or yellow (may use 1 other type of vegetable)
 - 2 Salads (or more) to include:
 - 1 Vegetable salad
 - 1 Fruit salad
 - 2 Desserts
 - 1 Baked dessert
 - 1 Pudding and/or ice cream or sherbet
 - 2 (or more) Fruits
 - 1 Fresh or cooked fruit
 - 1 Citrus fruit or fruit juice
- Whole-wheat or enriched bread and/or rolls with butter or fortified margarine
Sandwiches, if desired
Milk
Beverages
Coffee and/or tea

Sample Cafeteria Lunch or Dinner Menu I

Tomato juice	Peanut butter sandwich
Cream of vegetable soup	Diced fruit salad
Roast pork	Sliced tomato salad
Hamburger steak	Enriched rolls and butter or fortified margarine
Boston baked beans	Cherry pie — Baked apple
Parsley potatoes	Vanilla ice cream
Buttered string beans	Milk
Raw vegetable slaw	Coffee, cocoa, or tea
Chopped ham and egg sandwich	

Sample "Plate" Lunch or Dinner Menus (Based on Cafeteria Menu I)

<i>"Victory" Lunch or Dinner</i>	<i>Meat Alternate Lunch or Dinner</i>	<i>Soup and Sandwich Lunch or Dinner</i>
Tomato juice	Tomato juice	Cream of vegetable soup
Roast pork	Baked beans	Choice of 2 sandwiches
Parsley potatoes	Raw vegetable slaw	Raw vegetable slaw
Raw vegetable slaw	Rolls and butter or fortified margarine	Ice cream
Rolls and butter or fortified margarine	Ice cream	Milk, coffee, or tea
Cherry pie	Milk or coffee	
Choice of beverage		

Sample Cafeteria Lunch or Dinner Menu II

Chilled grapefruit juice	Bacon and sliced tomato and lettuce sandwich on whole-wheat (with mayonnaise dressing)
Fresh vegetable soup	Whole-wheat rolls and/or enriched bread, and butter
Veal cutlet	Baked caramel custard
Lamb stew with vegetables	Ice cream
Baked Spanish omelet	Chocolate cake
Steamed potatoes in jackets	Milk, coffee, or tea
Tossed mixed green salad with French dressing	
Beet greens	
Cheese sandwich	

Sample "Plate" Lunch or Dinner Menus (Based on Cafeteria Menu II)

<i>"Victory" Lunch or Dinner</i>	<i>Meat Alternate Lunch or Dinner</i>	<i>Soup and Sandwich Lunch or Dinner</i>
Chilled grapefruit juice	Grapefruit juice	Vegetable soup
Lamb stew with vegetables	Baked Spanish omelet	Choice of 2 sandwiches
Tossed mixed green salad	Potatoes	Tossed mixed green salad
Rolls and butter or fortified margarine	Rolls and butter or fortified margarine	Chocolate cake
Ice cream	Milk or coffee	Milk or coffee
Milk or coffee		

In most lunch and dinner menus there should be at least one meat, fish, or fowl dish, such as: Chops, steaks, hamburger, roast, pot roast; roasted, fried, or baked chicken; or fried, broiled, or baked fish. These are planned for persons who do not care for mixed dishes. In addition, especially for lunch, there should be one or two meat-extender or meat-alternate dishes. These foods may be less expensive than meats, they help to extend meat supplies and they lend variety to the menu. A list of some such dishes from which to choose follows:

MEAT-EXTENDER DISHES (CONTAINING A MODERATE AMOUNT OF MEAT)

Beef, lamb, or veal stew with vegetables
 Meat pie with vegetables
 Meat loaf
 Hamburger cakes
 Beef and kidney pie
 Hungarian goulash
 Pork or veal chop suey
 Chili con carne
 Poultry
 Chicken fricassee with vegetables
 Chicken pie
 Chicken loaf
 Chicken chop suey
 Chicken chow mein
 Fish
 Fish loaf
 Creamed fish with green peas
 Creole shrimps with rice
 Fish pie with vegetables

MEAT-EXTENDER DISHES (CONTAINING A RELATIVELY SMALL AMOUNT OF MEAT)

Spanish spaghetti (spaghetti, onions, beef, tomatoes, and cheese)
Roast beef or corned beef hash with minced potatoes and onions
Fried home-made scrapple (hominy grits or farina or corn meal with sausage or cooked meat)
Baked lima, kidney, Navy, or soybeans, seasoned with ham, bacon, salt pork
Sausage casserole (sausage, onions, green peppers, celery, tomato catsup, and kidney beans)
Scalloped potatoes with ham or frankfurters
Croquettes or patties made with rice, macaroni, mashed potatoes, and cooked meats, and served with sauce or gravy

MEAT-ALTERNATE DISHES (VEGETABLES, CEREALS, COMBINED WITH ANIMAL PROTEINS OR COMBINATION OF ANIMAL PROTEINS OTHER THAN MEAT)

Macaroni and cheese
Baked noodles and cheese with vegetables
Baked cheese and rice custard
Creamed eggs on toast
Cheese fondue
Chinese omelet (rice, eggs, cheese)
Cheese rarebit on toast
Corn pudding (eggs, milk, corn)
Corn and green bean timbale (custard)
Egg timbales with cheese sauce
Vegetable casserole with cheese biscuits
Vegetable fritter with cheese sauce
Creamed spinach and poached eggs
Casserole of vegetables, with cheese sauce

BETWEEN-MEAL "SNACKS"

Foods served between meals should make a definite contribution to the worker's diet.

The studies of H. W. Haggard and L. A. Greenberg, of Yale University, on the effect of between-meal feedings indicate their beneficial effect upon the problems of absenteeism, efficiency, and the morale of the employee. They point out that it is not sufficient merely to provide readily assimilable carbohydrate at such feedings but it is important to remember that food taken between meals is an integral part of the diet as a whole. They state:

The energy content of the food given at two between-meal feedings might amount to 300 to 400 calories and thus constitute as much as 15 percent of the total intake of food. It was further evident that the diets of many of the employees were actually deficient in vitamins and minerals, or verged on such deficiency. Supplementary feedings with foods containing only carbohydrate further exaggerated these deficiencies. This feature of supplementary feeding constitutes the only valid criticism against eating "between meals." To obviate it, the food selected should contain both minerals and vitamins in addition to at least 30 gm. carbohydrate (5, p. 755).

There is no basic menu pattern for this type of service. The selection offered depends upon the facilities and the labor available. It may be restricted to fruit juices, milk, and cookies, or it may include all the foods on the list below, which contain essential nutrients and are suitable for this type of service:

Fresh fruits
Citrus fruit juices
Tomato juice
Sandwiches (enriched bread, ½ ounce butter or fortified margarine)
 (1) Filling of meat, fish, or poultry
 (2) Filling of eggs, cheese, nuts, vegetables, or legumes
Ice cream
Cake, cookies, or pastry
Milk, cocoa and/or coffee

MOBILE FOOD SERVICE

Basic-menu patterns for mobile types of food service are similar to those for cafeterias except that they offer a more limited food choice. The pattern also depends upon the facilities for service. Of the two sets of menu patterns given below, one is for units equipped to serve three hot dishes (soup, entree, and coffee, for example), and bottled milk; the other for units that have no facilities for serving hot foods, except vacuum cans for coffee.

In mobile food services of the first type, a menu pattern similar to the one given below might be used.

BASIC-MENU PATTERN FOR MOBILE FOOD SERVICE (HOT)

Breakfast

Fruits

Citrus fruit or fruit juice, and/or tomato juice

Main Course

Cooked whole-grain, enriched or fortified, cereals with whole milk or cream

Ready-to-eat cereals with whole milk or cream

Creamed eggs, hard-cooked egg in the shell

Scrapple, baked hash, sausage, ham

Creamed codfish or codfish cakes

Bread and Butter

Whole-wheat or enriched bread or rolls

Butter or fortified margarine

Beverages

Milk, coffee

Lunch or Dinner

Appetizer

Soup and/or citrus fruits, fruit juices, or tomato juice

Main Dish

Meat, fish, or poultry dish (stew, goulash, pie, loaf, etc.)

Salad

Chopped green salad or fresh tomatoes, or combination raw vegetables

Two Sandwiches (enriched bread and/or whole-wheat or rye, with $\frac{1}{2}$ ounce butter or fortified margarine)

(1) Filling made of meat, fish, or poultry or combination

(2) Filling made of eggs, cheese, nuts, vegetables, or legumes

Rolls and Butter

Whole-wheat and/or enriched rolls

Butter or fortified margarine

Desserts

Fresh fruit in season

Ice cream, sherbet, or pudding

Pastry, cake, or cookies

Beverages

Milk, coffee

BASIC-MENU PATTERN FOR MOBILE FOOD SERVICE (COLD)

Breakfast

Fruits

Fresh fruit, citrus fruit, or fruit juice and tomato juice

Main Dish

Ready-to-eat cereal with whole milk or cream

Bread and Butter

Whole-wheat or enriched rolls

Butter or fortified margarine

Jelly or Marmalade

Beverages

Milk and coffee

Lunch or Dinner

Appetizers

Citrus fruit or fruit juice, and tomato juice

Two Sandwiches (enriched bread with $\frac{1}{2}$ ounce of butter or fortified margarine)

(1) Filling of meat, fish, or poultry

(2) Filling of eggs, cheese, nuts, vegetables, or legumes

Salad

Chopped green salad, fresh tomatoes, raw vegetables, or fruit

Dessert

Fresh fruit in season

Ice cream or sherbet

Pastry, cake, or cookies

Beverages

Milk and coffee (iced drink in hot weather)

Standards for Meal Service

Quality

"Quality" is the *first requirement* of a good meal. To produce food of excellent quality requires careful buying of fresh, good-quality foods, proper storage and handling, correct processing, and scientific cooking.

Food of excellent quality may be served to industrial workers when:

1. The food buyer knows food grades and quality, writes careful specifications, and insists on delivery of the specified kind, amount, and quality of food.

2. There exists a well-planned and supervised food control system.

3. Adequate storage space is provided with maintenance of the required temperature for each class of food product.

4. The turn-over of perishable foods is rapid.

5. There is careful sorting of stored foods.

6. Standardized recipes are used, giving amount, yield, and scientific methods of preparation (including time and temperature) in brief, clear terms.

7. There exists careful, adequate supervision of food preparation and service by well-trained, able managers.

8. Preparation time is planned so that all foods will be ready promptly at the hour of meal service.

9. Foods are served freshly cooked. The aroma of fresh-cooked foods stimulates the appetite while the odor of stale foods has the opposite effect.

10. Foods are served at the correct temperature—hot foods hot, and cold foods cold.

Attractiveness

Attractiveness, or "eye appeal," is the *second requirement* of a good meal. It depends on attention to such esthetic values as:

1. Providing combinations of foods that give pleasing color contrasts. Vegetable combinations and garnitures should offer color contrasts—such as, carrot sticks and cooked spinach; sliced cauliflower and diced fresh tomatoes; mashed rutabagas, steamed potatoes, and a tossed green salad; scalloped potatoes and green beans.

Colorful garnitures, such as sprigs of parsley or watercress, chopped parsley, a dash of paprika, grated cheese, or thin slivers of orange or lemon rind, may be used effectively.

2. Serving combinations of foods that give different texture contrasts.

Not more than one soft or mashed food should be included in one course.

Whenever possible, something firm or crisp should be served, such as celery, raw-carrot sticks, turnip slices, radishes, green onions, a crisp green salad, or whole or sliced tomatoes.

Vegetables of different textures should be served together, such as broiled tomatoes and baked potato, green peas and cabbage and carrot salad, oven-browned potatoes and spiced beets.

A pleasing variety of flavors should be offered on each day's menu, as for example:

Not more than one strong-flavored food or highly seasoned dish should be served in one meal or in any one course.

Mild-flavored foods should accompany highly seasoned ones.

Food flavors should be combined so as to complement each other. Examples are roast turkey and cranberry sauce, roast pork and spiced crab apples, corned beef and boiled cabbage, roast duck with orange sauce, fried fish with tartar sauce, frankfurters with sauerkraut or hot potato salad.

Service

Correct and pleasing serving of food is a *third requirement* of a good meal. Precautions should be taken to see that the original freshness, savor, and nutritive value of the food is preserved so far as possible. Some principles of service that should be followed are:

Dishes and foods on the different units of the cafeteria counter should be arranged so as to appear to the best advantage. For example:

Each serving unit should be considered as a whole; each food item should be placed so that the whole unit will make an attractive, well-balanced picture.

Dishes and foods at the different serving stations should be arranged to give pleasing contrasts in color, texture, and form.

Good salesmanship should be used. Dishes that are being "pushed" should be placed on the counter in such a way that they will be seen first, will be where they appear to the best advantage, and are accessible to the server and customer.

Fresh fruits and salad greens should be served when cold and be well-trimmed and cleaned.

Counters should be clean and orderly at all times. In order to achieve this goal:

Spilled foods should be wiped up immediately.

The orderly arrangement and attractive color plan of counters should be maintained throughout the serving period.

Silver, serving spoons, china, paper napkins, containers, and waste should be picked up promptly when misplaced or dropped.

Ice counters should be kept fresh and clean. When the ice melts or becomes soiled it should be removed from the counter and replaced with fresh ice.

Menu Planning

Planning menus in advance is the *fourth requirement* for good meals. Although some changes may need to be made from day to day, the week's skeleton menus can be used as a guide and will

assist greatly in providing variety built around the "Basic 7" foods. When this procedure is followed the manager can give more thought to purchasing, to the control of food supplies, and to personnel problems.

The manager should:

Plan each day's menu to offer an interesting variety of dishes, and a selection of foods that varies from day to day, but always includes the seven groups of essential foods as defined by the Government's nutrition program.

Avoid having the same dishes appear at regular intervals on the week's menu, or combining the same foods too frequently.

Avoid such frequent use of popular dishes that they become tiresome.

Plan each day's meals so that there will be a surprise element for the workers who may eat in the cafeteria day after day.

Food Preparation

The *fifth requirement* for good meals is that the food be planned and prepared especially for each meal, and cooked and dished in as short a time as possible before serving. This plan of procedure will be found to be efficient, lead to better control of food, divide the kitchen work more evenly among the crews on different shifts, and provide food that is well-cooked.

Cost Control

Control of cost is the *sixth requirement* for good meals. Regulation of food production affects the cost as well as the quality of food served. When too large an amount of food is left at the end of the meal period, waste occurs. The re-used food affects the quality, standard, and nutritive value of the meals supplied to the workers. Recipes should be followed, and size of portions and yield determined. The quantity of food prepared should be based on the number of persons actually served. The dishes included on each menu should be selected so that the quantity of food prepared can be easily expanded or reduced if the number of customers served at any meal is more or less than anticipated.

FOOD PURCHASING

The purchasing technique required for mass feeding in war plants differs from that required for most hotels, restaurants, and hospitals because of the simplified menus commonly used. The fewer the choices offered on the menu, the larger must be the quantity of each food that is bought, stored, and prepared.

Production of cooked foods in extra large quantities limits the purchase of foods largely to those that may be prepared by steaming and baking rather than by grilling and frying. Stews, oven roasts, braised meats, meat loaves, and meat pies are examples of meat dishes that can be cooked satisfactorily in large amounts. Foods also must be purchased at relatively low cost if meals are to be moderately priced. Because of the short lunch period, the foods served must be of a type that can be transported and dished easily and quickly.

The following five rules should be observed when purchasing food:

1. Keep informed about the most recent rationing regulations affecting available foods, ceiling prices, and the point values of rationed foods. Also, be informed about the civilian food supply and the conditions that affect the kinds and amounts of foods available and cause revisions in point values and rationing regulations.

2. Know the nutritive value of the food purchased. Providing food that will furnish the workers' food requirements requires knowledge of food values, specifications for quality foods, careful planning of market lists, and proper transportation and storage after purchasing.

When meat, fish, poultry, and eggs and cheese are plentiful, it is an easy matter to supply choice of dishes containing sufficient protein of good quality. The selection of main dishes under war conditions proves more difficult. Meat-alternate dishes must take the place of meat dishes several times a week. Fish and poultry, eggs, and cheese, and milk dishes may be featured at certain meals or on designated days, as substitutes for rationed meats. Legumes, nuts, and cereals may be used to supplement animal proteins.

Cuts of meat such as chuck, plate, brisket, and flank, glandular organs, lamb breast and shoulder, veal breast and shoulder, pork shoulder, and smoked butts and "picnic" hams are just as nutritious as the choice cuts and are less costly.

When selecting fruits and fresh vegetables, choose those that are unwilted, fresh-colored, and that have been shipped and stored under proper conditions. Wilted vegetables or those of poor quality are not a good investment because they are wasteful of materials and short in nutrient values.

3. Know the cooked yield of foods. When buying a leg of lamb, for instance, know the average number of portions yielded per pound. This holds true for fish, poultry, vegetables, fruits, and other foods as well. Plan purchasing requirements by using standard recipes that give correctly calculated amounts of ingredients and the number and size of portions served. The average portion yield may be obtained by carefully checking the portions when the food is actually served.

4. Be familiar with all local sources of food supply; the most dependable markets for supplying fresh fruits and vegetables; the sources of the best-quality meat, fish, and poultry that can be purchased for a reasonable price. Patronize reliable firms whose volumes of business are large enough to care for the food needs of the plant.

5. Provide sufficient refrigerator and storeroom space. This is essential to intelligent, economical buying of food. Because of current difficulties in transportation, and shortages in food supply, the buyer may be forced to purchase large quantities of perishable foods when they are available on the market.

Meat can be held in storage refrigerators at a temperature of 35° to 38° F. several days, and fresh fruits and vegetables may be held, if necessary, for 2 or 3 days at a temperature of about 40° F. This is not the best practice from the standpoint of retention of

vitamin content but may be necessary in order to assure an adequate supply.

FOOD PREPARATION

Large-quantity food handling and cooking requires expert knowledge, skill, and experience. It also requires the right tools.

The following suggestions will be found helpful in improving methods of cooking foods in large quantities:

1. Study the cooking methods best suited to the efficient and economical preparation of food. Mass food production requires streamlined methods and avoidance of waste motion such as bending, stooping, and unnecessary handling. Methods of cooking should be used which require a minimum amount of time and supervision on the part of the cook. Large-quantity food preparation requires equipment, such as compartment steamers, steam-jacketed kettles, roasting and baking ovens with temperature control. "Top of the stove cooking" needs to be used relatively little.

2. Employ proper methods of cooking to conserve nutrients.

a. Preventing Loss of Vitamin B₁ (Thiamine)

Foods containing vitamin B₁ should be cooked in the least water possible. This is especially true of vegetable cooking. The water in which vegetables are cooked should be served with them or be added to soups, sauces, and gravies, since it contains valuable amounts of vitamins and minerals. To get the benefit of their vitamins, the liquor and juices should be served at the meal for which the source foods are initially prepared. Steam-pressure cooking, steaming whole, baking in their skins, and boiling peeled vegetables in large pieces will decrease the loss of thiamine.

Soda is destructive of vitamin B₁ and should not be added to the vegetable cooking water. Meats lose substantial amounts of this vitamin by most methods of cooking. Frying is less destructive than other methods. Roasted or baked meats lose 20 to 60 percent of their vitamin B₁, averaging about 40 percent. Losses are higher in well-done than in rare meat.

Vitamin B₁ losses may increase considerably when food is held long after cooking. For this reason food should be served as soon as it is prepared. It should not be held in bain-marie pans or on steam tables longer than is absolutely necessary, never more than ½ hour.

b. Preventing Loss of Vitamin C (Ascorbic Acid)

Canned and quick-frozen fruits and vegetables may have greater vitamin C content than fresh products which have been exposed to the air at ordinary temperatures for as long as 24 hours after picking. Wilted fruits and vegetables retain very little of their original vitamin C content.

Fresh and canned fruits and tomato juice should be opened and prepared just before serving because exposure to the air is destructive of vitamin C. When it is necessary to open cans of fruit juices or squeeze fresh citrus fruits before they are needed, the juice should be put in covered containers immediately and stored in the refrigerator until serving time.

It is possible to reduce the loss of vitamin C by cooking foods in the absence of oxygen. To do this, they should be cooked rapidly so that the vaporized steam will cover the kettle forming a blanket between the food and the oxygen of the air. Since slow cooking methods greatly increase the destruction of this vitamin, vegetables and fruits should be brought rapidly to the boiling point, and cooked until just done.

After fresh apples have been pared and cored they should be submerged in a 2.5 percent salt solution and kept there until ready to cook. This method will preserve the color and decrease the loss of vitamin C (7).

Quick-frozen fruits and vegetables should be kept in the freezer until ready to cook, then be placed immediately in boiling water or the pressure steamer and cooked until just tender.

Every precaution should be taken to keep fruits and leafy salad greens refrigerated while they are being prepared for cooking and service. Rules for preparation are as follows:

As soon as received from market, place crates or hampers of vegetables in refrigerator at a temperature of 45° F.

When ready to clean, remove outer coarse leaves and trim. Wash vegetables in very cold water and let stand in the water about 10 minutes, or until freshened. Then finish trimming, coring, or cutting, and place in draining baskets or on trays and return to the refrigerator.

After salads are set up on serving plates they should be returned to refrigerator and held there until time for service.

Chopping and crushing fruits and green vegetables, unless they are handled very carefully, increase the loss of vitamin C. Keep the greens crisp and mix with dressing just before serving. Chop cabbage and other vegetables as short a time as possible before cooking or serving.

Whole oranges, grapefruit, apples, and peaches have more vitamin C than the sliced or chopped fruit or the juice. Therefore, prepare these fruits just before they are served.

3. Keep abreast of scientific investigations and utilize approved methods and temperatures that give the most satisfactory products, for instance, minimum volatile and dripping losses in meats and poultry, and the conservation of the vitamin and mineral content of vegetables and fruits. Meat and vegetable cookery has been revolutionized in recent years as a result of research in cooking methods.

Some cooks have been slow to adopt low-temperature cookery, due to the managers' failure to instruct them in recent scientific findings. In wartime, when every portion of meat saved contributes to the world food supply, food service managers should study low temperature meat cookery and train their cooks to practice it. Publications describing this method can be obtained from the U. S. Department of Agriculture, Bureau of Human Nutrition and Home Economics, Washington 25, D. C.

Overcooking and holding foods for long periods in the bain-marie or on the cafeteria steam table is detrimental to quality, palatability, and nutrient content. Therefore, foods should be

prepared especially for each meal and served promptly after cooking.

FOOD SERVICE

A few suggestions that will help to facilitate the service of food to workers are:

1. Have each type of dish or food ready to serve to the worker. There is little time for individual service and not much opportunity to feature dishes that require special catering. Roasts should be carved before they are placed on the steam table; vegetables, salads, and desserts should be on the serving counter and ready to place directly on the worker's tray.

2. Serve all foods in standard-sized portions that have been determined to be adequate. The portion of each food should be designated in ounces, or by dimensions, if weight is not practicable. Portions may be dished from standard-sized scoops and ladles to regulate the size of the serving. Baked dishes, cakes, and pies may be cooked in standard-sized containers and then cut into a definite number of uniform portions. The use of standard portions makes it possible to:

Serve portions of uniform size.

Determine the portion yield of each recipe.

Plan accurately the amounts of prepared food to be produced.

Control costs and price foods correctly.

Order food supplies on the basis of known requirements.

3. Foods served from mobile units should be those that can be easily handled and quickly served. Proper containers and utensils for serving them should be provided.

4. Arrange foods on cafeteria counters and on mobile wagons so that the food is displayed to the best advantage. Consider "eye appeal" as a factor affecting the worker's selection of a well-balanced meal.

Management Summary

Food of excellent quality may be served to industrial workers when a carefully coordinated plan of food management is followed. Such a procedure involves these factors:

1. A basic-menu pattern which meets the nutritional requirements of the workers, and fits the plant lay-out and working conditions.

2. Meals that are nutritious, well-balanced, and appetizing—served at a moderate price.

3. Foods that are purchased according to menu requirements, storage conditions, preparation facilities, and staff, by a buyer who considers quality obtained in relation to price paid.

4. Provision of adequate storage space and correct temperature control for all foods. Careful sorting of stored foods and rapid turn-over of highly perishable foods.

5. Standardized recipes provided by the dietitian or manager that give amount, yield, and scientific methods of preparation (including time and temperature) written in brief, clear terms.

6. Careful, adequate supervision of food preparation and service by well-trained, able managers.

7. Foods that are freshly cooked and served at the proper temperature for the product.

THE "BASIC 7" FOOD GROUPS

Group 1—Green and yellow vegetables (raw, cooked, frozen, or canned).

Group 2—Oranges, tomatoes, grapefruit, or raw cabbage or salad greens.

Group 3—Potatoes and other vegetables and fruits (raw, dried, cooked, frozen, or canned).

Group 4—Milk and milk products: Fluid, evaporated, dried milk, or cheese.

Group 5—Meat, poultry, fish, or eggs, or dry beans and peas, nuts, or peanut butter.

Group 6—Bread, flour, and cereal—natural whole-grain or enriched or restored.

Group 7—Butter and fortified margarine.

FACILITIES AND EQUIPMENT FOR INDUSTRIAL FEEDING⁴

The purpose of this chapter is to describe the facilities and equipment which have been found to be practical in the operation of various types of industrial food services. The nomenclature and definitions are according to the criteria adopted by the War Food Administration.

To determine the most suitable types of facilities for a given plant, the factors outlined in figure 1 must be considered.

The type of facilities chosen depends upon the total number of meals to be prepared, the meal pattern, length and number of lunch periods, plant area and distribution of people, and finances.

The total number of meals to be prepared, the number of meals to be prepared at peak load, and the meal pattern determine the amount of food required, and the amount of preparation space and equipment. The delivery schedules and the amount of food required determine the storage space needed.

The number of people seated and served at one time is determined by the length and number of lunch periods and the distribution of feeding facilities.

Facilities may be reduced considerably by staggering the lunch period. For example, a plant feeding 2,000 workers would require seating space for 2,000 people if everyone were served at one time. The use of 2 staggered lunch periods would reduce the seating space by approximately one-half. If 4 staggered periods were used, only 500 workers would need to be seated at one time, which would result in a corresponding reduction of the seating area.

The stationary canteen serving only packaged foods should be used only when it is impossible to provide other more complete types of facilities. Its use may be determined by one or both of the following conditions: Where the type of work performed does

⁴ Complete information on facilities and equipment for industrial feeding will be found in Industrial Feeding Facilities. Copies may be obtained from the War Food Administration, Washington 25, D. C.

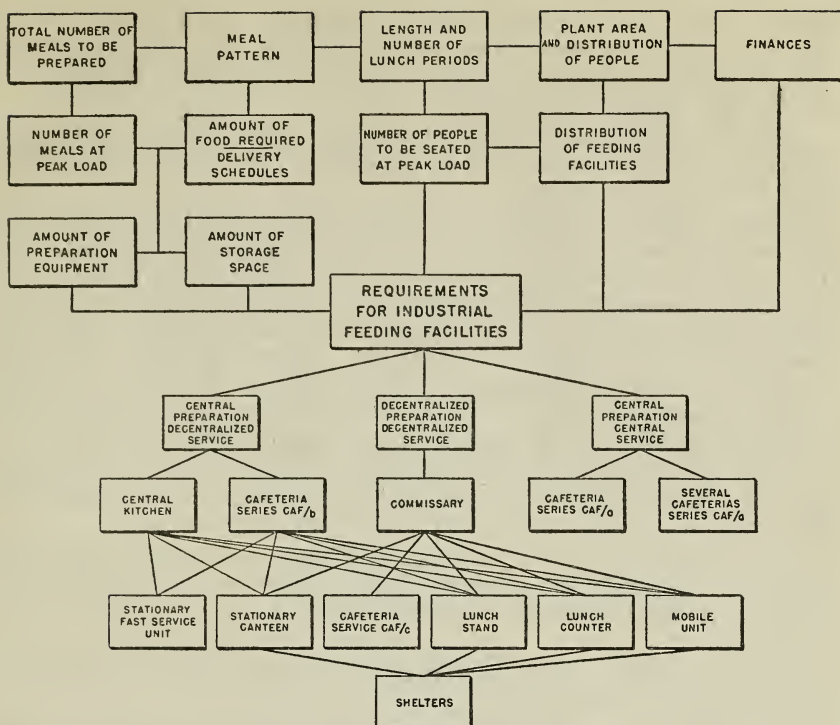


FIGURE 1. Basic factors governing selection and design of industrial feeding facilities. Cafeteria series *a*, *b*, and *c* refer to Industrial Feeding Facilities (see footnote 4).

not allow the worker to leave the building, or where small groups of workers are distributed over a large area.

Every effort should be made to separate the canteen from work areas, in order to maintain effective sanitation. If the canteen is located outside a building, shelter should be provided. In both cases comfortable seating facilities should be included.

Mobile Units

Mobile units are loaded at the commissary or central kitchen and are moved to designated places at scheduled periods. They serve complete hot meals, sandwiches, and beverages; or one hot dish, sandwiches, and beverages; or cold foods only.

Hospitals were the first institutions to make use of mobile units. They use such facilities to serve meals to patients in wards located at a distance from the main kitchen.

Mobile food service can be used to best advantage in plants where small numbers of workers are scattered among widely dispersed work areas, for example, many shipyards and ordnance plants; when the lunch period or the type of operation does not allow sufficient time for workers to patronize a stationary facility; or where space cannot be made available for stationary facilities.

Mobile units may be used where employee concentration fluctuates rapidly. In such cases, the units can be shifted to meet changes, or the number of units may be increased or decreased to meet changing requirements.

The staggered lunch period utilizes fewer food-service employees over a longer period of time than is required when there is a single lunch period.

These factors, combined with the plant size, the distribution of workers within the plant, and the capital investment, will determine the type of food service. Plants that cover a large area and have a scattered distribution of workers may require decentralized food service. In a compactly arranged plant, a centralized food service would be desirable. Figure 1 shows the components of decentralized and centralized food services described in the following section. The various elements may be used in suitable combinations to provide the most satisfactory service.

Food service should be considered a part of the general plant lay-out. Specifications for the feeding services should be given to the architect, along with the general plant requirements.

It is impossible to give one over-all figure in square feet to be used in calculating total space requirements for all types of feeding facilities. There are two separate and distinct factors to be considered:

1. The kitchen area is determined by the number of meals to be prepared at peak load.

2. The seating space, including aisles for those waiting in line and scullery and serving space, is determined by the number of persons to be seated.

Table 1 will assist in determining the number of square feet of kitchen area needed.

TABLE 1.—*Kitchen-area coefficients, based on meal loads*¹

Meal load	Base figure	Coefficient (square feet)
100 — 200	200	5.00
200 — 400	400	4.00
400 — 800	800	3.50
800 — 1,300	1,000	3.00
1,300 — 2,000	2,000	2.50
2,000 — 3,000	3,000	2.00
3,000 — 5,000	5,000	1.85
5,000 — 8,000	8,000	1.70

¹ These coefficients are approximate, and are based on the standard plans developed by the War Food Administration.

They are applicable to central kitchen-space determinations, as well as to cafeteria kitchens. Since few industrial feeding establishments have meal loads above 8,000, coefficients have not been developed for larger facilities.

Seating-Space Coefficient—17 square feet per person seated. (Seating-space coefficient includes space for aisles, dishwashing unit, serving counters, and the space behind serving counters.)

Types of Service Units

Commissary

(Storage house for kitchens, cafeterias, etc., where meat is processed to cooking stage and vegetables are cleaned and prepared for cooking. Includes bakery, sandwich making, and box-lunch preparation.)

The commissary contains complete facilities for storage; for the rough preparation of meats and vegetables; for sandwich making; and for baked goods. The food is prepared to the cooking stage and then is delivered in insulated containers to dependent units where it is cooked and served. With this arrangement, the food is cooked in the same building in which it is served, and therefore the nutritive losses caused by holding may be minimized.

The commissary also may be equipped with a kitchen unit for the preparation of meals to be served from mobile units, lunch counters, and lunch stands. It also may service central kitchens, and thereby eliminate storage facilities, sandwich room, and meat and vegetable precooking units from the central kitchens.

Central Kitchen

(Has complete food preparation, bakery, and storage facilities. Serves stationary fast-service units, lunch counters, and all other types of service units.)

Central kitchens are becoming an important facility in industrial feeding. They may be located outside the plant and service several small plants equipped only with serving facilities, or they may service large plants where decentralized food service is required. All storage and preparation facilities thus may be concentrated in one building.

Both the distance involved in transporting the food and the type of food service should be considered in the plan of the central kitchen. Holding, loading, and sterilizing facilities may vary according to the type of transportation facilities used, and with the distance food has to be transported. The food may be shipped in insulated containers or it may be prepackaged for distribution in canteens. Where mobile units are used, loading docks equipped with cleaning, sterilizing, and maintenance facilities for the units must be provided.

It must be remembered that food loses in nutritive value and appearance if held after cooking, and therefore the location of the central kitchen should be as close as possible to the final serving stations.

Cafeterias

(Self-contained cafeteria with full food-storage, food preparation, and serving facilities.)

Cafeteria service became popular during the first world war because foods were scarce and management found difficulty in obtaining food-service workers. It became necessary to find some way of feeding large numbers of persons quickly with a minimum of labor. Self-service was found to be the best solution to this problem. The original conception of self-service was to create mass buying and to obtain a large average check by displaying a

great variety of attractive foods. This wide choice of food necessitated extensive steam table and counter space for display and slowed the serving line. Modern industrial cafeterias serve a limited choice of foods and use short service lines.

The objective of intelligently planned industrial feeding is to provide well-planned and nutritionally adequate meals at a moderate price. The cafeteria form of service is suitable to feeding in industrial plants because through this device a large number of persons may be served in a short period of time. Fewer employees are required than when table service is used and other operational costs are lower.

Lunch Counters

(Prepared food is received from central kitchen in insulated containers. Serves full meals and has short-order facilities and seating space.)

Lunch counters are food service units planned to occupy minimum space and to serve a limited menu. Major food preparation is done at the central kitchen, and short orders only are prepared at the counter. Lunch counters should be designed to meet a definite service need and should be located conveniently throughout the plant to provide meals or snacks for workers. In small plants this type of food service may be all that is necessary. Lunch counters, serving food items to supplement home-packed lunches, are sometimes installed in cafeteria dining rooms to relieve the traffic congestion at the cafeteria counters.

Stationary Fast-Service Unit

(Food received from central kitchen in insulated containers. Complete meals served directly from containers. Includes lunch counter for supplemental feeding. Has seating space.)

The stationary fast-service unit may be used where large numbers of workers must be served during short lunch periods. Food is completely prepared in a central kitchen and delivered to the stationary, fast-service unit in insulated containers. The food is served directly from the insulated containers which are returned to the central kitchen to be washed and sterilized.

Fast feeding is accomplished by reducing the selection to one or two complete nutritious meals. Consequently, the serving system should be arranged to enable the worker to make his choice of meal before entering a line. When the worker's choice is made, he picks up the "plate lunch" waiting for him and proceeds to select bread, salad, dessert, and beverage. Cashiers may be placed at the beginning of the line so that there will be no delay; or scrip or coin turnstiles may be used to speed the service.

Lunch counters are used in the stationary, fast-service units for the sale of items that supplement home-packed lunches.

Lunch Stands

(Hot and cold food delivered from central kitchen. No seating space.)

Lunch stands are planned to serve a limited menu of hot and cold foods. Hot food is received from a central kitchen in insulated containers and served from the same containers. Cold food is prepackaged.

Lunch stands serve an important function in industrial feeding because they can be used to supplement cafeteria service or may be used in small plants to serve a limited menu of nutritious foods.

Stationary Canteen

(Packaged hot and cold food delivered from commissary or central kitchen. Has facilities for storing hot and cold food.)

The mobile unit is not the most satisfactory solution to the industrial feeding problem. Where it is used, the food generally is served in working areas and no seating facilities are provided.

Shelters

(Used in connection with mobile units, canteens, lunch stands, etc.)

Shelters should be provided wherever mobile units, canteens, and lunch stands are located in the open air. Mobile units, canteens, and lunch stands offer only a partial solution to good industrial feeding when no shelter is planned. Workers who must stand in line and eat exposed to unfavorable weather conditions cannot be expected to derive the maximum benefit from the lunch period.

Shelters do not have to be expensive or permanent. They can be of temporary or portable construction. Enclosed shelters offer the best accommodations. An open-air pavilion type of shelter with seating or with stand-up arrangements is acceptable under favorable weather conditions.

If the mobile unit, canteen, or lunch stand plan is determined to be most feasible, there must be a definite plan for the prompt return of empty milk bottles and for the disposal of empty packages and uneaten or waste food. Empty bottles left standing on the floor or stairs are an extremely serious accident hazard. Also, bottles left on top of lockers or window ledges may fall and cause serious injury.

Empty food packages and waste food scattered around the plant not only produce an unsanitary and unsightly condition but also may be the cause of disastrous falls and bodily harm.

Design Detail

General Principles of Lay-out

The preparation of food is a production process. The individual work units should be planned in relation to the sequence of food production operations. Figure 2 shows the logical progression of operations and the fundamental principles to be used in planning food-service units.

Kitchen Lay-out

The kitchen manager's office should be located so that it will have complete control over the receiving, storage, kitchen, and serving areas, as well as over the entrance and exit of kitchen personnel.

A long, narrow, or irregularly shaped kitchen is unsatisfactory since it is expensive to equip, wasteful of floor space, and difficult to supervise and to operate.

FIGURE 2.—Food-production flow chart.

The receiving area should be placed adjacent to the storerooms and refrigeration units. Adequate control of these areas will reduce food loss. Marketing conditions and purchasing methods should be known so that sufficient food storage and refrigeration space can be planned.

Work units for the rough preparation of food, such as vegetable cleaning and meat cutting, should be placed so that supplies move in sequence from storage to final preparation and to serving or loading areas with as little lost motion as possible.

Enclosed Areas

Where operations are closely interrelated, enclosing walls around work units should be avoided, since they set up barriers to fast production and make supervision difficult. Walls with a generous amount of glass are desirable around bake shops to keep flour dust within the baking area.

In commissaries and central kitchens, the bake shop, kitchen, sandwich-preparation room and other self-contained units should be enclosed to provide for temperature control, specialized-work control, and more efficient operation.

Refrigeration Units

Walk-in refrigerators should be divided into compartments, with individual thermostatic control regulating the temperatures according to type of supplies stored. It is recommended that vegetables and fruits be stored at temperatures of about 40° to 45° F.; dairy products at about 40°; meats at from 33° to 38°; and frozen foods at from 0° to 10° F.

Sufficient refrigeration space for each preparation and serving unit should be provided. The pastry department, bake shop, kitchen, salad and sandwich departments, each require reach-in refrigerators for holding daily supplies and taking care of cooked foods.

In a cafeteria, the refrigerator in the salad and sandwich departments should be placed in the dividing wall directly back of the salad section of the serving counter and equipped with doors opening on both faces. This arrangement will save many steps in moving salads and sandwiches to the point of service. The accessibility of the preparation departments to the service units should be a major consideration in planning every lay-out. Special refrigeration units also are required for such supplies as milk, fruits, and desserts. The type of unit used depends upon the counter arrangement.

Refrigerated display counters for salads, fruits, and beverages should be provided. These counters may be chilled by mechanical refrigeration coils or they may be counter compartments constructed to hold crushed ice.

Adequate space should be allowed for refrigeration machinery. Where chipped ice is used in large quantities, special storage space should be provided.

Locker and Toilet Rooms

The personnel should enter the kitchen directly through locker rooms to wash and change into uniforms before going to work areas. Showers should be installed even in the smallest operation.

Toilet rooms and lockers should never be adjacent to food storage areas or open directly into the kitchen.

American Standards Code Z4.1 should be consulted (1).

Hand Sinks

Hand sinks should be installed at all food preparation and serving units. They should be placed conveniently so that employees will not wash their hands in food sinks.

Dishwashing

There are two ways of returning soiled dishes to the scullery; either the customer carries his own dishes, or the tables are cleared by bus boys. If the system of self-bussing is used, the scullery should be located near the exits, or dish conveyors may be installed along the dining room walls.

Ample space should be allowed for the dishwashing room or sculleries. Studies should be made of the number of dishes coming out at peak hours and the speed with which they can be put back into service. Sufficient table and shelf space should be available for scraping, stacking, and feeding dishes into the dishwashing machines. Space for handling, washing, and sterilizing glasses should be included. Delays in the dishwashing department during the lunch period may seriously handicap the operation.

A steam booster on the dishwashing machine may be necessary in order to provide water of at least 170° F. for rinsing the dishes.

Provision should be made for precleaning soiled dishes before they go into the dishwashing machine. This may be accomplished by having a hose connection and drain near the scraping section, and a sink for the prewashing. Dishwashing runways at both the soiled and clean dish sections should be sloped and furnished with drains to carry off excess liquids. Shelves under the runways should be provided for storing dish baskets.

For a further discussion of sanitary principles, reference should be made to Public Health Bulletin No. 280 (4).

Dining Room Lay-out

Dining rooms should be planned so that customers can line up at the service counters, take trays to the tables, and leave the dining room after finishing their meal, without interfering with the service traffic. Aisles or corridors should be arranged where the workers may line up under shelter.

Dining rooms should provide a pleasant environment where employees can relax and enjoy social contacts. They should be attractively decorated, adequately lighted, well-ventilated, and soundproofed against outside and inside noise. Comfortable chairs should be furnished in preference to benches or tables with attached seats. Dining rooms may be equipped with public address systems for plant announcements, music and safety and nutrition education.

Engineering Construction Factors

Precautions should be taken to make kitchens sanitary and easily cleaned. Floors should be constructed on a concrete base and finished with nonslip material, impervious to water and grease, and easily cleaned. They should slope toward drains. Depressions should be provided under all steam equipment and have individual drains. Floors should join the walls with sanitary coves and have rounded corners.

All work spaces should be provided with sufficient and correct lighting. In selecting the type of fixtures and determining the amount of illumination the following considerations are important.

For general lighting, use diffused light to avoid glare. Lights should be hung at correct distances from work surfaces and light bulbs shielded with globes. Individual sources of illumination should be provided for the main work units.

The hot-water supply should be checked. If it is not adequate to meet the needs of food service and dishwashing, provision should be made for an additional supply of hot water.

Garbage and Trash Disposal

Garbage and trash-collection rooms should be separated from food-preparation and storage areas. They should be constructed of durable, washable, and sanitary materials. No floor drains should be used unless they are of the rodent-control type. The floors should be sloped to drain so that the rooms may be scrubbed and hosed. The garbage room should be refrigerated and, if possible, should have an outside entrance. All garbage should be kept in tight nonabsorbent and easily washable receptacles and be covered with close-fitting lids. A hose with hot and cold water or steam connection should be provided for cleaning and sterilizing garbage cans.

FOOD-SERVICE PERSONNEL

Feeding workers on the job is a high-speed mass production process requiring specialized food-service installations capable of being operated at a minimum cost in food, equipment, and labor. Cafeteria service reduces the number of employees needed below that needed for table service, because considerable saving in labor results when prepared foods are served from steam tables and cold counters directly to the customers. The number of service employees can be reduced further when the customers return their trays to receiving stations after the meal is finished.

Staffing In-Plant Feeding Facilities

The number of persons required for the food-department staff and the duties assigned to each of them, will depend upon the type of food operation, the menu, and the number of meals served. The size of the staff will also be affected by the efficiency of the management.

Reducing Labor Hours by Efficient Operation

Efficient operation of a food service requires intelligence, a sincere interest in the job, and careful planning. It demands a deep feeling of responsibility on the part of management. There are many problems requiring attention; one of these is manpower, and another is the cost of labor. There are a number of ways of keeping labor hours and costs at a minimum, without interfering with high standards of operation:

1. A simplified menu can be used, featuring dishes adapted to mass production. Labor will be saved because relatively few items of food need to be handled. Service will be speeded as the workers will be able to make their food selections rapidly.

2. The lay-out of the kitchen and work stations should be arranged for the greatest efficiency.

3. Every part of the operation requires advance planning. When good-quality food is purchased, time and labor are saved in food preparation. All supplies needed for the day's operation should be at hand when the employees begin the day's work.

4. The manager, or his assistant, should analyze each job and then work out brief, explicit instructions for the performance of the work. These should be used in employing and training workers.

5. Inexperienced employees should not be put to work without careful instructions. Time is saved if new employees are introduced to their jobs; are shown where to report for work, how to find lockers and washrooms, their work stations and supplies and tools. This type of in-service training improves the morale of the worker by giving him confidence in his ability and a feeling that his job is an important and integral part of the organization.

In-service training may seem impossible to many managers under present conditions, but it is the only way that efficient operation can be achieved and maintained. Most kitchen jobs can be broken down into a series of simple operations. When techniques of work are involved, demonstrations should be given and the workers provided with an opportunity for practice. Training cooks and bakers is one of the more difficult tasks because, in order to achieve success, the supervisor needs to be familiar with the details of the work, must have standardized and tested recipes, and must be provided with clear instructions for all work processes. If the manager combines these attributes with adequate supervision, it is possible to train an intelligent employee to be a cook or a baker in a relatively short time. (Table 2.)

The following occupational classification shows the staff required for several types and sizes of in-plant feeding operations serving a simplified menu. A job description has been written for each regular occupation. The job descriptions are in general terms and may be modified to meet varying job conditions.

TABLE 2.—Occupations required for staffing in-plant feeding facilities

Occupational classification	Mobile unit	Lunch stand	Lunch counter	Cafeteria units ¹		
				"A"	"B"	"C"
1. Manager	1	1	1	1
2. Dietitian ²	1	1	1
3. Assistant manager	1
4. Baker	1	1
5. Bus boy (or girl) ³	2	2	3	4
6. Butcher ⁴	1½	1
7. Cashier-checker ⁵	1	1	1	2	3
8. Cook, general	1	1	1
9. Cook, assistant	1	2	2
10. Cook, short-order	1	..	..	..
11. Counter attendants ⁶	3	5	8	10
12. Dish and glass washer (hand) ⁷	2	..	..	..
13. Dish and glass washer (machine) ⁷	2	3	4
14. Kitchen helper	1	2	2	3
15. Pantryman (or girl)	1	2	2	3
16. Receiving clerk	½	1
17. Salesman (attendant) ..	2	1	..	..	..	..
Staff per unit	2	2	12	18	27	36

¹ "A" units serve 250-400; "B" units serve 400-800; "C" units serve 800-1,300.

² May assume full managerial responsibility or may function as food-production manager.

³ More persons will be needed where tables are not cleared by customers.

⁴ May be combined with duties of receiving clerk.

⁵ Handles sale of candy and tobacco also.

⁶ Number will depend upon counter arrangement and the number of items on menu. May be reduced proportionately with food-assembly method of tray service.

⁷ May be reduced if paper service is used.

Job Descriptions for Necessary Occupations in Industrial Feeding

1. Manager—full time; training period—6 months to 1 year

Sets standards for food quality, quick service, and reasonable prices. Determines food purchases in relation to customers' food needs and preferences and available civilian supply. Orders food and supplies, arranges for their delivery, and for the maintenance of adequate inventories. Controls food costs, and supervises record keeping and accounting. Is responsible for selection and assignment of personnel.

In large units, the manager delegates some of the above duties to his staff. Part or all of these duties may be assumed by the dietitian.

2. Dietitian—full time; graduate from a recognized college or university with a major in foods and nutrition or institutional management—training period 3 to 6 months

Plans menus; makes out requisitions for food and supplies, and may do the purchasing; checks supplies received from dealers and approves the invoices; requisitions supplies from the storeroom; standardizes recipes and supervises food preparation; inspects cooked food issued to serving counters; supervises serving of food; takes ice-box and storeroom inventories; calculates food costs; supervises cleaning of premises; keeps time records; instructs and supervises employees.

The dietitian may assume the duties of the manager or may work closely with him. In cooperation with the plant physician she organizes and directs the nutrition education program.

3. *Assistant Manager—full time; training period—6 months to 1 year.*

Acts for the manager in matters pertaining to the preparation and use of food, and the maintenance of efficient, clean, and orderly methods of work. Exercises general supervision over cooks, prescribing the foods to be cooked and specifying the amounts of each item to be prepared. Instructs and supervises the kitchen workers in the operation and care of equipment. Keeps time and production records for kitchen employees. May plan menus and requisition food. Takes regular inventories of supplies and equipment, and reports replacement requirements to the manager.

Part or all of these duties may be assumed by the dietitian in the capacity of food production manager.

4. *Baker—full time; training period—6 months*

Makes bread, rolls, pies, and puddings; mixes, cuts, and shapes dough by hand or machine.

5. *Bus Boy (or girl)—part time; training period—1 week*

Clears tables of soiled dishes; carries dishes to the dishwashing section; replenishes supplies of trays, tableware, napkins, and water glasses; sweeps, cleans, and dusts dining room floors, furniture and equipment.

6. *Butcher—part time; training period—3 months*

Cuts, trims, and prepares carcass meats; cuts individual portions of meat, fish, and poultry to the specified size and weight; stores supplies of meats in ice box. Keeps butcher unit and meat-storage box clean.

7. *Cashier-Checker—part time; training period—1 month*

Checks prices of foods on customers' trays; receives payment from customers for food served and makes change. Checks cash against record of receipts. Keeps record of number of customers served and of the cash receipts. Checks change bank and keeps it made up to the prescribed amount. May make up bank deposits and pay roll.

8. *Cook, general—full time; training period—6 months*

Prepares, cooks, and may serve soups, meats, and vegetables under direction of the dietitian. May bake pastries, hot breads, make desserts. May supervise kitchen employees in small establishments.

9. *Cook, assistant—full time; training period—3 months*

Assists cook in preparing and serving foods. Prepares vegetables for cooking; may operate peeling, chopping, grinding, and other mechanical kitchen equipment; services and cleans equipment; keeps cook's unit orderly and clean. May do other tasks assigned by the dietitian or the head cook.

10. *Cook, short order—full time; training period—3 months*

Cooks to order and serves grilled and fried meats, eggs, hot cakes, and other quickly prepared foods. May serve soups, meats, and vegetables from the steam table.

11. *Counter Attendant—part time or full time; training period—1 to 2 months*

Serves food to customers at lunch or cafeteria counter either by filling the orders directly from the kitchen, or by serving the

order from the counter at the customer's direction. Maintains the cleanliness and orderliness of serving station and equipment. Sets up food on serving counter prior to food service period, and properly disposes of leftover food at the end of the serving period. May perform various tasks in the preparation of food such as preparing toast, waffles, hot cakes, sandwiches, and beverages. May receive payment from customers and make change, or issue food checks.

12. *Dishwasher, hand—full time; no specified length of training period*

Washes and dries china, silver, and glassware by hand. Cleans equipment and working areas. Washes pots and pans. May assist other kitchen workers with such tasks as cleaning, preparing vegetables, and obtaining and distributing supplies. May do other routine tasks such as polishing silver, cleaning ice boxes, and washing windows. This job is found ordinarily in the smaller establishments.

13. *Dishwasher, machine—part time or full time; training period—1 week*

Operates automatic dishwashing machine to wash china, glassware, silver, and trays. Scrapes and stacks soiled dishes; loads and unloads dishbaskets; sorts and stacks clean dishes. Polishes silver periodically. Cleans machine and working area.

14. *Kitchen Helper—full time; no specified length of training period*

Washes and dries pans and other utensils used in food preparation and service. Cleans kitchen machines. Puts away the clean utensils. May sweep and scrub the kitchen floor. Carries out garbage and waste and cleans the cans. Does other routine tasks such as cleaning ice boxes and washing windows. May assist with vegetable paring and preparation. May relieve cooks of routine operations such as watching and stirring foods and mashing potatoes. The specific duties of this job depend upon the size of the establishment and the staff employed.

15. *Pantryman (or girl)—full time or part time; training period—3 months*

Prepares fruits, salads, cocktails, and other cold dishes. Makes sandwiches for short orders or in quantities. Prepares tea, coffee, and other beverages. Cuts butter. Slices cold meats and cheese. Sets up bread trays. Serves bread and butter and desserts. Keeps preparation space and equipment clean and orderly.

16. *Receiving Clerk—part time or full time; training period—1 month*

Receives and inspects all incoming foods and supplies. Checks the weights and amounts of the goods received with the purchase order. Reports discrepancies in goods received. Stores goods properly, and issues them in accordance with requisitions. May keep a running inventory of foods and supplies. Reports shortages to manager. May successfully combine these duties with those of the butcher in medium-sized units.

17. *Salesman (mobile unit and lunch stand attendant)—part time; training period—3 to 4 weeks*

Stocks mobile unit or stand with food in kitchen or from the delivery truck prior to the serving periods. Serves food from mobile unit or stand. Receives payment from customers and makes change. Propels mobile unit from one location to another. Returns mobile unit to kitchen at the end of the serving period. Reports sales and receipts to manager.

Filling Key Positions

Mobile Food-Unit Operators

Small mobile units can be operated by one employee, but complete cafeteria mobile units may require from three to four employees. One person should be appointed in charge of the operation of each unit. He should be made responsible for the cash and the merchandise. When the truck leaves the kitchen he should be given a change bank of 10 to 20 dollars. This change and the cash receipts from the sale of the merchandise must be returned. An inventory should be made of the merchandise on the food truck, and the operator charged for its full value. When he returns to the mobile unit depot he must either return the merchandise or its equivalent in cash value.

Employing Food-Service Workers

Most food-service managers are faced with the problems of securing many new employees and also with a high labor turnover in regular jobs. The following sources of manpower are available: High school students and trade and vocational school students who are not old enough for either the armed forces or for industrial war work; older men and women who are capable of doing good work but who had not been considered employable in peacetime when younger workers were available; persons who previously had not worked outside their homes. Many such persons are eager to take advantage of the present opportunities for employment and are often the most intelligent and dependable of the employee group now available. Part-time and volunteer help frequently comes from this age group.

The employment of students should be in accordance with minimum age and other standards of Federal and State child-labor laws. In connection with the utilization of students for part-time work, attention is directed to the statement, *Policies for Part-Time Employment of School Youth*, issued by the War Manpower Commission, September 1943.

Employing Women Workers

Food service is not a new field of work for women. For years many restaurants have employed full crews of women workers. Experience in managing a home is one of the best qualifications for this type of work. Older women may make excellent cooks and bakers; younger women usually fill all other jobs satisfactorily.

Women have proved themselves capable of filling any food-service job in an industrial plant, provided that the working conditions are suitable. For instance, they can operate mobile units, but that assignment might not be recommended in a plant which employs only men workers.

When a crew of women is employed, provision should be made for the employment of some male porters to do heavy lifting, clean the floors, carry dishes, and do other heavy jobs. Heavy lifting is prevalent in the industry and all workers should be selected and trained according to the weight lifting required by the particular job. The Department of Labor has published an excellent pamphlet on the prevention of weight-lifting injuries which deserves study by food-service managers (10).

Women employees prefer to work in a well-administered organization where their duties are clearly defined and carefully supervised, and they appreciate fair play on the part of their superiors. Many women cooks prefer to use standardized recipes, and most of them take pride in their work. Cooks who are well-trained and intelligently supervised will assume their share of the responsibility for serving wholesome and nutritious food and thus help to maintain the health of the workers.

Employing Part-Time Workers

Many hospital dietitians and local food-service institutions have obtained excellent results by using part-time volunteer help both from outside and within the institution. Part-time workers can be useful as service-counter employees, dishwashers, cashiers, salad and sandwich workers, and can assist with the preparation and service of mid-shift snacks. Plans should be made for making the best use of part-time service, before such workers are employed. Their effective use depends upon such managerial procedures as: Appointment of a supervisor of part-time workers; analysis of all part-time jobs and duties and the preparation of work sheets and schedules for each job and careful selection of employees. Their general duties as well as their responsibility to the organization should be explained to applicants before they are employed. Those employed should be introduced to the workers in their unit and taken on a tour of the entire food-service department, so that they are familiar from the outset with the department's lay-out.

Utilizing Employment Services

Every community has agencies through which workers can be obtained. Some of these are:

1. The local offices of the United States Employment Service. This organization is the best place to contact food-service workers because the Service functions as a clearing house for all kinds of employment. The United States Employment Service is organized into divisions, each specializing in a certain job classification, one of which handles applicants for food-service employment.
2. Principals and student advisers of high schools and vocational schools as well as the placement bureaus of colleges and universities. These may be able to suggest candidates for food

service jobs, particularly those requiring trade skills or professional training.

3. Community groups such as welfare organizations, public health groups, and committees doing war work, who are often in a position to know of persons available for work.

Plant management may have some difficulty in finding suitable applicants for managerial positions in their food service, as such positions require both professional training and experience. Persons qualified as managers of industrial food departments are:

1. Dietitians, because of their training in foods, nutrition, and institutional management. The American Dietetic Association, the professional organization of this group, maintains for its members a placement bureau in Chicago, Ill.⁵ The association has high standards and requirements for membership. Plant management can rely on recommendations made by the placement bureau because the credentials of all candidates are on file. These credentials include recommendations from the applicant's major instructors in college or university, and from former employers. Every effort is made by the placement service to fit candidates into the type of job for which they are best qualified.

2. Managers of food service organizations can be obtained among dietitians, former hotel stewards and restaurant managers. Other than the American Dietetic Association, which recommends dietitians with the necessary qualifications, there is no central agency that recommends applicants for managerial positions. The National Restaurant Association headquarters in Chicago, and the local offices of the State Restaurant Associations may be able to suggest candidates but they do not maintain regular placement bureaus.⁶ Qualifications for this type of position should be at least 3 or 4 years' experience in the food production departments of large restaurants, clubs, colleges, or school lunchrooms. Managers should be expected to have a professional attitude toward their work, be well informed about the national food situation, and be interested in carrying out pertinent recommendations of the National Research Council and Government agencies concerning the health and nutrition of war workers.

EDUCATIONAL PROGRAMS

It is not enough merely to make vitamin and mineral-rich foods available to workers who have not been in the habit of eating them. It has been found that, generally, at least one-half of the workers select poor lunches, even when good choices are possible. A survey of the diets of 1,103 aircraft workers in southern California showed a large number to be low in green and yellow vegetables, tomatoes and citrus fruits, milk and eggs (11). Educational programs are necessary.

If workers are to form good food habits they must understand what foods and combination of foods are best for them. Because likes and dislikes vary greatly, and because food habits are the result of environment and training and are not easily

⁵ American Dietetic Association Placement Bureau, 620 North Michigan Avenue, Chicago, Ill.

⁶ National Restaurant Association, Educational Director, 8 S. Michigan Ave., Chicago, Ill.

changed, food habits must be taken into consideration in planning nutrition educational programs. Such programs must also be planned to obtain the best use of available foods.

An effective educational program to improve the diets and food habits of industrial workers involves three avenues of approach. First, an educational campaign should be made an integral part of the food service operation within the plant, to teach workers to select the foods necessary to meet their nutritional requirements. Second, the workers' families should be taught how to select food, how to prepare and serve meals at home, and how to pack appetizing and nourishing lunches. Finally, food-service directors should be instructed on meal planning, marketing, storage, preparation, and service problems to assure efficient operation and the preservation of food nutrients and palatability.

In-Plant Educational Programs

To be most effective, nutrition-education activities in the plant should be closely related to the food-service operation. Many techniques have been used. Outstanding among them are those based upon employee participation.

Employee Participation Through Menu Contest

One good example of this technique is the program at an aircraft plant where 8 to 10 thousand employees are fed daily. Before the program began, the workers' selection of food was poor as well as costly. Checks ran as high as 80 to 90 cents.

To correct this, a 45-cent Victory Vitamin Luncheon, consisting of a meat, two vegetables, a beverage, bread and butter, and dessert, was introduced. To promote this lunch among the workers, a different table tent card is used daily. One side gives the menu for the following day and the other side presents nutrition and other information in an informal manner.

A menu contest was launched, and the response, though slow at first, demonstrates that great interest has been stimulated among the workers. The winner, with the week's best menu, is given 5 dollars as a prize and is ceremoniously entertained with three guests of his own choice at lunch at the plant. All persons whose menus receive honorable mention receive 1 dollar and a free lunch.

When the program was launched, only 23 percent of the trays represented a good lunch selection, 50 percent were fair, and 27 percent were poor. A resurvey conducted 1 year later shows 52 percent to be good, 36 percent fair, and 12 percent poor. A poll of the employees indicates that 92 percent think the food is good and 80 percent think that the price is all right.

Employee Participation Through Tray Evaluation

A lunch-tray appraisal program was developed by a county Industrial Nutrition Committee to appraise the nutritional merit of the food selected in cafeterias in certain plants where excellent food is provided at low cost. A booth was set up near the cafeteria line and approximately 30 percent of the workers came to the booth to have their trays rated. A certificate with rating was given for each tray analyzed.

Milk, raw fruit, salad, and the main dish were checked. Workers asked many questions which clearly indicated that genuine interest had been aroused. This was shown also by the change in the workers' eating habits. Since the tray evaluation, 51 percent more salads were consumed, 22 percent more milk, 11 percent more fruit, and 23 percent more fruit juices.

Employee Participation Through Committee Representation

In a western plant, new employees are taught nutrition when they are inducted. Lectures are given, lists of food one must eat for an adequate daily diet are distributed, and score cards are passed out so each employee can score himself daily.

This educational program is closely tied in with the cafeteria operation which is run without profit and, insofar as is possible, run the way the employees want it run. Through representation on a committee, the employees themselves decide what they want and do not want on the menus, and how the dishes shall be served. When only eight 10-cent packages of cookies sold daily, the committee discovered the reason—the package was too big. When the same package was divided and sold for 5 cents, sales shot up to 60 a day.

Plant Publication and Nutrition Education

One of the best ways to reach the employee is through the house organ with informal, feature presentation of nutrition facts. These publications usually are popular with the employees and their families. At one plant, employees are given information in a feature column entitled *Fundamentally Domestic* and in regular news stories. The cafeteria manager has painstakingly kept records of employee food consumption, breaking down the "Basic 7" foods in relation to the employees' food dollar. Dairy products represent approximately 40 percent of the workers' food dollars in this plant, where nutrition education has been an important part of the plant's labor relations program.

Nutrition Posters, Exhibits, and Literature

Strong, colorful posters and well-chosen literature are used by most plants conducting nutrition-education programs. Although these aids stand on their own in educational work, they are many times more effective when used to support an integrated program or campaign. Government material is available; other material has been developed by commercial firms, health and welfare organizations, State, county, and city nutrition groups. Posters have aided materially in educating workers to choose the lunch specials.

One plant uses a concentrated display of the "Basic 7" posters and table tent cards. After a week, walls and tables are cleared, because interest shown at first begins to lag. After a few weeks, posters and table tent cards go up again, and so does employees' interest, as reflected in more careful food selection.

In some plants, special exhibits have been used very effectively. Many exhibits have been developed around the "Basic 7" foods. An interesting exhibit used by a Pennsylvania plant features the foods essential to national strength, showing what foods the family table should include daily.

Plant Loudspeakers

A large plant in the Midwest that has conducted effective nutrition education for almost 2 years combined most of the above techniques in a well-rounded educational program. Here short, informal talks about the importance of good food selection go out over the loudspeaker during the lunch period and can be heard throughout the plant. Other plants using this idea report good results. Some also use the loudspeakers for plant announcements, music, and education in safety.

Nutrition Courses for Employees

In one of the Nation's largest business organizations, 40,000 employees throughout the country completed a special 18-month nutrition course. Cafeteria food selections have been closely observed, and results are gratifying. More green vegetables and salads are sold to accompany meat and potatoes. There is a greater demand for fruit, milk and milk desserts. Women are eating more breakfasts. Indirect results are reflected in the medical department, where an increasing number of requests for assistance on individual and family nutrition problems are recorded.

Educational Programs for Workers' Families

The conduct of educational programs for families of workers is a community as well as a plant responsibility. In some instances, it has been found effective to extend the plant program to the workers' families. This has been done successfully as a cooperative venture of the plant and a community group such as the local nutrition committee.

The vital part of an educational program for war workers' families consists of classes in all practical problems concerned with the preparation and serving of nourishing meals. The first class should be devoted to explanations and discussions of the importance of nourishing foods and what women can do to keep their families strong and well. This should be followed by classes on selection and purchase of food, meal planning, cooking, and practical nutrition. To be successful the classes should make practical application of nutrition facts. It is important that teachers understand the interests and living conditions of the group and that they talk in language that can be understood. In some communities, classes are called "clubs" and meet at regular intervals. Club meetings are planned to be entertaining as well as educational.

Training Programs for Management of Food-Service Units

No educational plan for encouraging workers to eat nourishing foods can succeed unless the foods served to them in plant cafeterias, from canteens, lunch counters, and mobile wagons has high nutritional value and is served in an attractive fashion so that employees learn to appreciate their gustatory possibilities as well as their nutritional worth (7).

Many industrial food-service operations employ methods of food preparation that result in substantial losses of food nutrients.

Often there are avoidable losses of minerals and vitamins in vegetables simply because they are cooked in larger quantities than needed.

Training programs for food service managers and chefs should take into consideration the pride of accomplishment on the part of the chef, and should be carried out with tact and discretion. He should be assured that the suggested methods of cooking will not unduly interfere with his routine, that cooking foods in limited quantities for the meals for which they are intended will divide up the work more evenly among the service employees on the different shifts, that the entire program will be an aid to him in meeting food-supply conditions.

Subjects which should be covered include: (1) Explanation of the National Nutrition Program, its purpose and accomplishments to date; the importance of nourishing food to the health and productive efficiency of workers; (2) what it means to serve nourishing food; a discussion of nutrient losses caused by methods used in handling, preparation and service, and how these losses can be reduced; (3) planning and serving meals which provide the nutrients required by the plant employees in proper amounts; (4) keeping workers interested in their plant meals by offering menu variations from day to day; and (5) employing attractive service methods to enhance the appetizing appeal of food.

Plant food-service managers should be encouraged to subscribe to professional and trade magazines. These magazines carry many practical articles on the application of nutritional principles in restaurant operation. They will also keep operators posted on new rationing procedure and how to meet problems of shortages in labor, supplies, and equipment.

Nutrition Programs Planned by Business Organizations

A number of equipment and public utility companies have developed nutrition programs which are available to industries and to community organizations. Generally, it is not required that any of the company publicity be used and the charges are based on the cost of printing the pamphlets, posters, and other materials.

Following is a brief description of the characteristic features of several of these programs.

Servel, Inc., Evansville, Ind.

Servel, Inc., promotes a nutrition program which may be sponsored by local gas companies. The success of the program depends upon the whole-hearted cooperation of all organizations and industries participating.

The first step in putting on this program is to set up an organization for carrying it out. The gas company and the local nutrition committee might get together and make plans for sponsorship. A subcommittee for nutrition in industry might be appointed, consisting of local people representing agencies in the community interested in the welfare and health of its residents.

The second step is to sell the program to local industries. After this is done, each plant sets up a plant advisory committee made up of executives, the plant nutritionist, the plant physician, and representatives from the personnel, advertising, sales promotion, and food-service departments. It is the function of this committee to advise and work with the subcommittee on nutrition in industry and to supervise the in-plant program.

After the preliminary organization is set up and ready to function, the program can be launched. The following diagram is put out by Servel, Inc., and shows the plan of operation.

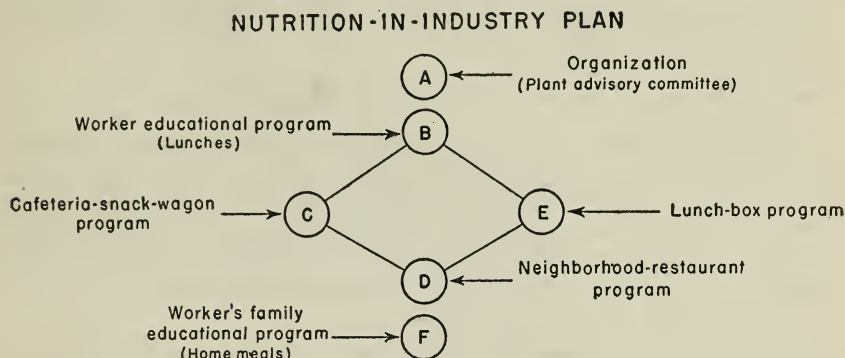


FIGURE 3.—Operation of Servel feeding program.

Servel, Inc., has used the resources of its advertising and sales promotion departments to give the program personal interest, and all material used is of the type that will appeal to workers. They call it the “Eat to Beat the Devil” campaign and all pamphlets and illustrative material are built around this slogan.

Westinghouse Electric & Manufacturing Co., Mansfield, Ohio

This company was among the first to start a nutrition program for workers’ families. In the summer of 1941, their home economics department decided to make a survey of grocery stores, and independent stores as well as supermarkets, to see what the people of Mansfield, Ohio, were eating. The survey showed that very few homemakers were selecting food because of its nutritive value, and menu planning was left mostly to chance.

After this survey it was decided that a nutrition program for homemakers was necessary. To arouse the interest of the women it was found necessary to make the educational information interesting, entertaining, and dramatic.

A “Health for Victory Club” was organized. Its objective is selling health to every worker’s family. The club activity impresses the women with their responsibility to help cut down absenteeism in factories, due largely to poor eating habits.

The following is the outline of the plan:

1. The nucleus of the program is the monthly club meetings for the wives, mothers, sisters, and daughters of war workers, and for managers of boarding houses where war workers live. A Meal Planning Guide gives complete menus for each month and recipes for dishes suggested. The cost of the menus is based on the average food budget of the women. Every member of the club gets one of these booklets at the monthly meeting.

2. The Daily Food Requirement Chart is used as a basis for the subject matter for each meeting. Only one section is discussed at one time.

3. All scientific and factual subject matter has been reduced to simple, understandable terms.

General Electric Consumer Institute, Bridgeport, Conn.

The General Electric Company has a nutrition program planned for the employees of their Schenectady works. The material for this program was worked out very carefully by their Consumer Institute and set up in compact form for use in their factories and for other industries interested in it. The following materials are supplied by the General Electric Consumer Institute.

1. Bimonthly Nutrition Column.

Cartoon-style mat service furnished by G-E bimonthly for use in news organs of plants. Each mat: (a) Dramatizes an interesting food fact; (b) carries an important message about nutrition direct from Washington; (c) provides homemakers with recipes for using the latest Department of Agriculture Victory food selections and recipes for overcoming food shortages. This column, containing official Government information with a human interest twist, will do much to encourage workers to take the publication home.

2. The Government-approved nutrition booklet—How to Get the Most Out of the Food You Buy. (24 pp.)

3. Pack a Lunch That Packs a Punch. (Pamphlet.)

It includes a simple wartime-lunchbox plan which helps the housewife to work out balanced, appetizing meals from a wide variety of foods.

4. Restaurant-Menu Service.

This service shows how to serve Victory Lunches that sell for no more than regular prices, contribute their quota of nutrients, and attract workers.

5. Nutrition Wall Banners.

6. Nutrition Displays.

7. Master Guide.

This gives complete information on how to conduct nutrition and homemaking courses for employees, wives, and daughters. (Form No. 398-1664.)

SOURCES OF INDUSTRIAL FEEDING AND NUTRITION EDUCATIONAL MATERIALS

Government Publications, Posters, and Films

Available free from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C., or from Regional Offices (see page 46 for addresses).

PUBLICATIONS

Planning Meals for Industrial Workers— NFC—2.
National Wartime Food Guide— NFC—4, revised.
Your Employees Are No Better Than the Food They Eat—a Nutrition Program for Industry— NFC—7.
Eat a Lunch That Packs a Punch— NFC—8, revised.
Eat a Good Breakfast to Start a Good Day— AWI—107.
99 Ways to Share the Meat— AWI—13.
Cheese in Your Meals— AWI—16.
Fats in Wartime Meals— AWI—34.
Root Vegetables in Wartime Meals— AWI—39.
Dried Beans and Peas in Wartime Meals— AWI—47.
Green Vegetables in Wartime Meals— AWI—54.
Cooking with Soya Flour and Grits— AWI—73.
Potatoes in Popular Ways— AWI—85.
Egg Dishes for Any Meal— AWI—89.
Tomatoes on Your Table— AWI—104.

POSTERS

Eat the Basic 7 Every Day (cartoons, color).
Avoid Fatigue (cartoon, color).
Eat 3 Well-Balanced Meals Every Day (slogan, color).
Good Food Means Good Work (slogan, color).
For Health . . . Eat Some Food from Each Group . . . Every Day (color).

INDUSTRIAL FEEDING TABLE-TENT CARDS

Set of 7 on Basic Foods (cartoons, color).

Available free from the War Food Administration, Washington 25, D. C., or from Regional Offices (see page 46 for addresses).

PUBLICATIONS

Are You Hit By . . . Absenteeism . . . Accidents . . . Low Production . . . Labor Turn-over—Here's How to Get Help.
Industrial Feeding in Manufacturing Establishments, 1944.
Making the Most of Meats in Industrial Feeding.
Saving Sugar in Industrial Feeding.
Industrial Feeding Facilities. (Distribution limited to architects, engineers, equipment manufacturers, food service equipment industry, colleges and schools with institutional management courses, libraries, State health and labor departments.)

PERIODICALS

Industrial Nutrition Service—monthly (for employee publications, individuals, and groups promoting nutrition education).
Serving Many—monthly (food news for food managers in industrial plants, restaurants, hotels, and hospitals).

Available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

PUBLICATIONS

- Training Restaurant Sales Personnel, by Ruth M. Lusby, U. S. Office of Education, Federal Security Agency. 35 cents.
The Road to Good Nutrition, by Lydia J. Roberts, Children's Bureau, Department of Labor. Publication No. 270, revised. 10 cents.

FILMS

- War Film List—(Including nutrition films). Office of War Information, Bureau of Motion Pictures, Washington 25, D. C. Free.
Wartime Nutrition (1 reel, 16 mm., sound)—(The role of food in good health.) Office of War Information, Bureau of Motion Pictures, Washington 25, D. C. Also from local distributors. 50 cents a week, service charge.
New Harvests for Victory (1 reel, 16 mm., sound, black and white)—(Explains where, why, and by whom food is needed: the troops, sailors, industrial workers, our allies, and liberated countries; where and why the raw products for armament and supplies are needed; how they are used.) Produced by U. S. Department of Agriculture. (For distributors, see item below.)
Crops for Combat (1 reel, 16 mm. and 35 mm., sound, black and white).—Produced by Agricultural Adjustment Agency. This film and New Harvests for Victory (above) are distributed by Motion Picture Services, U. S. Dept. Agr., Washington, D. C., or may be obtained through the Extension Services of the State Agricultural Colleges of most States. Free or for a small service charge plus the cost of transportation.
U. S. Army Training Films on Mess Preparation.—Available through Army Service Commands.
War Department Film Slides on Mess Improvement: Series 832 entitled Promote Good Food Habits and Series 853 entitled Food for Health. Available through Army Service Commands.

CANADIAN FILMS

- Food—Weapon of Conquest, 2 reels, 16 mm., sound. (Importance of food in warfare.) Produced by Canadian Film Board, released by Du-Art Film Laboratories, 245 West 55th Street, New York, N. Y. Free except for transportation charges.
Food in Industry (16 mm.)—Addressed to the war worker who of necessity must eat his—or her—meals at varied hours and under difficult conditions. The film explains what we should eat during a working day to keep up maximum strength and energy.

BRITISH FILMS

- Eating at Work (1 reel, 16 mm., 35 mm., sound). (Industrial nutrition.)
Dig for Victory (1 reel, 16 mm., 35 mm., sound). (Victory Gardens.)
Mrs. T and Her Cabbage Patch (1 reel, 16 mm., 35 mm., sound). (Victory Gardens.)

British films may be obtained for a small service charge plus transportation, or may be purchased from the following depositories:

Central Depository—British Information Service, Film Division, 30 Rockefeller Plaza, New York, N. Y.

Regional Depositories—British Information Services, Film Division, 1336 New York Avenue, Washington, D. C.; The Film Officer, British Information Services, 360 North Michigan Avenue, Chicago, Ill.; The Film Officer, British Information Services, 260 California Street, San Francisco, Calif.; The Film Officer, British Consulate, 448 South Hill Street, Los Angeles, Calif.

Other Sources

PUBLICATIONS

- American Institute of Baking, 10 Rockefeller Plaza, New York, N. Y.
Enriched Bread—What Leading Authorities Say About It. Free.
Enriched White Bread. Free.
Enriched Flour and Bread from the Housewife's Viewpoint, by R. R. Williams. Free.
- American Meat Institute, 59 E. Van Buren St., Chicago, Ill.
Wartime Meat Problems. A series of releases discussing basic methods of cooking different cuts of meat. Free.
- American Red Cross, 17th and D Sts., N. W., Washington 13, D. C.
Instructor's Outline—The Canteen Course (A Program in Mass Feeding). ARC 786, 38 pp. Limited distribution; intended for use of Red Cross canteen instructors. Red Cross chapter nutrition chairmen can arrange to make the course available to untrained food service staffs of industrial cafeterias or lunchrooms. Free.
Suggestions on Feeding in a Disaster. ARC 994, 62 pp. 1942. Free.
- Associated Industries of Massachusetts, 833 Park Square Bldg., Boston, Mass.
Weekly menu and nutrition service for industrial feeding establishments.
- Evaporated Milk Association, 307 N. Michigan Ave., Chicago, Ill.
School Lunches. 16 pp. Free.
Quantity Recipes for Quality Foods. 64 pp. Free.
Quantity Recipes for Canteen and Mass Feeding. 16 pp. Free.
The Lunch Box. 8 pp. Free.
Feeding a Family at Low Cost. 16 pp. Free.
- H. J. Heinz Co., Pittsburgh, Pa.
Manual of Foods—Composition and Value. Free.
- Massachusetts Agricultural College Extension Service, Amherst, Mass.
Community Meals. Bulletin No. 137. 5 cents.
- Metropolitan Life Insurance Co., New York, N. Y.
Three Meals a Day. Free.
Lunchrooms for Employees. 28 pp. Free.
Your Food. 4 pp. Free.
The Lunch Box Goes to Work for Victory. 8 pp. Free.
- National Association of Manufacturers, 14 West 49th St., New York, N. Y.
Food, Work and War. Free.
Health on the Production Front. Free.
The Lunch Box Can Increase Production. Free.
- National Livestock and Meat Board, 407 S. Dearborn St., Chicago 5, Ill.
Cooking Meat in Quantity. Free.
Low Heat for More and Better Meat. Free. Bulletin showing advantages of low-temperature cooking.
Meat Point Pointers. 40 pp. Free. Wartime meat recipe book containing 105 tested recipes.
Meat Buying Manual. Free. A guide to meat selections, for the teacher, student, and homemaker.
Variety Meats. Free. Gives 34 recipes for heart, liver, kidney, tongue, sweetbreads, brains, and tripe.
- National Research Council, 2101 Constitution Ave., Washington 25, D. C.
The Food and Nutrition of Industrial Workers in Wartime. Reprint No. 110. 17 pp. 1942. Single copies free.
Recommended Dietary Allowances. Reprint No. 115. 6 pp. Single copies free.
The Nation's Protein Supply. Reprint No. 114. 10 pp. 1942. Single copies free.
A Report on Margarine. Reprint No. 118. 20 pp. 1943. Single copies free.
Inadequate Diets and Nutritional Deficiencies in the United States. Bulletin No. 109, 56 pp. 1943. 50 cents.
Enrichment of Flour and Bread: A History of the Movement. Bulletin No. 110, 130 pp. 1944. Single copies free.
The Facts About Enrichment of Flour and Bread. 16 pp. 1944. Single copies free.

- National Restaurant Association, 8 South Michigan Avenue, Chicago 3, Ill.
 Suggestions and Recipes for Meat Alternates and Extenders. 25 cents.
- Ohio Dietetic Association, Cleveland Health Council, 1001 Huron Road, Cleveland, Ohio.
 Manual for Managers of Rural and Other Small School Lunches. 226 pp. \$1.50. (Contains a section with recipes suitable for use in war plants.)
- Public Affairs Committee, Inc., 30 Rockefeller Plaza, New York, N. Y.
 Vitamins for Health. No. 69, 32 pp. 10 cents.
 The Kitchen in War Production. 28 pp. 10 cents.
 Have We Food Enough for All? 28 pp. 10 cents.
- Safeway Homemakers Bureau, Box 660—CC, Oakland, Calif.
 Kitchen Course in Nutrition. 99 pp. Price 25 cents. A simplified course of study of the principles of nutrition and how to apply them in planning, cooking, and serving everyday meals.
- Servel, Inc., Evansville 20, Ind.
 Eat to Beat the Devil. 34 pp. Free. (A war worker's guide to good eating.)
 Nutrition-in-Industry Plan. 38 pp. Free. (A program of procedure.)
 Wartime Food and Nutrition Program Kit of Materials. Free.
 Home Volunteer Guides to Better Nutrition. Free.
- Standard Brands, Inc., 595 Madison Avenue, New York 22, N. Y.
 Feeding War Workers. 27 pp. Free. (A manual on how to provide adequate nutrition at moderate cost.)
- Westinghouse Electric & Manufacturing Co., Mansfield, Ohio.
 How to Pack Lunch Boxes for War Workers. 24 pp. Free.
 How to Halt Health Sabotage in Your Home. 6 pp. Free.
 The ABC's of Eating for Health. 16 pp. Free.
- Wisconsin Alumni Research Foundation, Bascom Hall, Madison, Wis.
 Time Is Precious—Keep 'em Working. 20 pp. 75 cents.

CHARTS AND POSTERS

- American Meat Institute, 59 East Van Buren Street, Chicago, Ill.
 Eat the Right Foods (in color, 37" x 29"). Free.
- Evaporated Milk Association, 307 North Michigan Avenue, Chicago 1, Ill.
 For the Calcium You Need. Free.
- H. J. Heinz Co., Pittsburgh, Pa.
 A Guide to Better Nutrition. Free.
 Nutritional Charts. Free. (Restricted to professional use.)
- National Dairy Council, 111 North Canal Street, Chicago 6, Ill.
 A Guide to Good Eating (in color, 8½" x 11"). Price 4 cents.
 Milk Made the Difference (10" x 28"). Price 11 cents.
 Equivalent Posters (set of 3 posters in color, 19" x 25"). 25 cents each. (Dramatize the important food sources of calcium, protein, and riboflavin.)
 America Needs—Poster Series (4 posters in color, 12" x 18"). 10 cents each. (Stresses the importance of good health to the strength of our Nation.)
- National Livestock and Meat Board, 407 South Dearborn Street, Chicago 5, Ill.
 Eat the Right Food Daily. Free. (A series of 12 charts with illustrations. Accompanying lecture keyed to charts.)
 Meat on the Home Front. Free. (Set of 15 illustrated charts with accompanying lecture on meat selection, cookery, and conservation.)
 The 4 Corners of a Square Meal. Full color. Free. Shows excellent, good, and fair food sources of protein, minerals, vitamins, and calories.
 Food Value Charts. Free. (Full color set of 6 charts giving nutritive value of common foods in graphic form.)
 Nutrition Reference Charts. Free. Set of 3 charts.

Servel, Inc., Evansville 20, Ind.

"Basic 7" Government Food Rules Chart (full color). Free.

Eat to Beat the Devil. Free.

Food Promotional Series (5 colorful posters). Free.

Food Educational Series (4 colorful posters). Free.

Pledge of Cooperation—Restaurant Card. Free.

Wisconsin Alumni Research Foundation, Bascom Hall, Madison, Wis.

Nutrition Check-up Chart. Students, 3 cents. Free to specialists.

FILMS

Metropolitan Life Insurance Co., 1 Madison Avenue, New York 10, N. Y.

Proof of the Pudding (16 mm., sound technicolor). Free.

National Dairy Council, 111 North Canal Street, Chicago 6, Ill.

A Guide to Good Eating (1-reel, 16 mm., sound technicolor). Free.

More Life in Living (1-reel, 16 or 35 mm., sound). Free.

New York University Film Library, 71 Washington Square South, New York 12, N. Y.

And So They Live (3-reel, 16 mm., sound). Rental \$4 per day, \$8 a week.

The Children Must Learn (2-reel, 16 mm., sound). Rental \$3 per day, \$6 a week.

Eating at Work (1-reel, 16 mm., sound). Rental \$1.50 per day, \$3 a week.

LITERATURE CITED

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1935. SAFETY CODE FOR INDUSTRIAL SANITATION IN MANUFACTURING ESTABLISHMENTS. American Standards Code Z4.1, 18 pp. New York.

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1943. A STUDY OF THE EFFECTS OF ODD-SHIFTS UPON THE FOOD HABITS OF WAR WORKERS. In the Problem of Changing Food Habits, Natl. Res. Council Bul. 108, pp. 82-84.

(3) FEDERAL SECURITY AGENCY, OFFICE OF THE DIRECTOR OF DEFENSE, HEALTH WELFARE SERVICES.

1942. PROCEEDINGS OF THE NATIONAL NUTRITION CONFERENCE FOR DEFENSE. 254 pp., illus. Washington.

(4) FEDERAL SECURITY AGENCY, UNITED STATES PUBLIC HEALTH SERVICE.

1943. ORDINANCE AND CODE REGULATING EATING AND DRINKING ESTABLISHMENTS. U. S. Pub. Health Bul. 280, 60 pp., illus. Washington.

(5) HAGGARD, H. H., AND GREENBERG, L. A.

1941. THE SELECTION OF FOODS FOR BETWEEN-MEAL FEEDING IN INDUSTRY. Amer. Dietet. Assoc. Jour. 17:753-758.

(6) METTERT, M. T.

1942. HEALTH OF WOMEN IN WAR-TIME PRODUCTION. Nat. Safety News 45 (6): 34, 38, 82-83.

(7) NATIONAL RESEARCH COUNCIL.

1942. THE FOOD AND NUTRITION OF INDUSTRIAL WORKERS IN WAR-TIME. Natl. Res. Council Reprint and Cir. Ser. 110, 17 pp. Washington.

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1943. RECOMMENDED DIETARY ALLOWANCES. Natl. Res. Council Reprint and Cir. Ser. 115, 6 pp. Washington.

- (9) OFFICE OF WAR INFORMATION.
1942. RECOMMENDATION ON HOURS OF WORK FOR MAXIMUM PRODUCTION; BY COMMITTEE REPRESENTING WAR DEPARTMENT, NAVY DEPARTMENT, MARITIME COMMISSION, PUBLIC HEALTH SERVICE, WAR MANPOWER COMMISSION, WAR PRODUCTION BOARD, COMMERCE DEPARTMENT, LABOR DEPARTMENT. 4 pp. Washington.
- (10) UNITED STATES DEPARTMENT OF LABOR, DIVISION OF LABOR STANDARDS.
1943. A GUIDE TO THE PREVENTION OF WEIGHT-LIFTING INJURIES. Spec. Bul. 11, 19 pp., illus. Washington.
- (11) WIEHL, D. G.
1942. DIETS OF A GROUP OF AIRCRAFT WORKERS IN SOUTHERN CALIFORNIA. Milbank Mem. Fund Quart. 20: 329-366, illus.

ADDRESSES OF REGIONAL OFFICES OF THE WAR FOOD ADMINISTRATION

NORTHEAST REGION

New York 7, N. Y.

150 Broadway.

(Includes: Maine, Vermont, New York, New Hampshire, Massachusetts, Connecticut, Rhode Island, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, District of Columbia.)

MIDWEST REGION

Chicago 3, Ill.

5 South Wabash Avenue.

(Includes: Iowa, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Illinois, Indiana, Ohio, Michigan, Wisconsin.)

SOUTHERN REGION

Atlanta 3, Ga.

Western Union Building.

(Includes: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia.)

SOUTHWEST REGION

Dallas 1, Tex.

425 Wilson Building.

(Includes: Arkansas, Oklahoma, Texas, Louisiana, Colorado, Kansas, New Mexico.)

WESTERN REGION

San Francisco 3, Calif.

821 Market Street.

(Includes: Arizona, California, Nevada, Oregon, Washington, Idaho, Montana, Utah, Wyoming, Territory of Hawaii.)



